

Diagnostic Engineering Publication

IBM POUGHKEEPSIE
December 31, 1964

1410/7010

Subject: Diagnostic Program T020C - Tape Operations Test

Sequence Number 201

Replaces T020B

T020 requires information about system and channel configuration in order to operate properly. The minimum information required, for use at installation time is described on Summary page 003, the last page of T020 documentation.

When running from cards be sure that the Standard System Control Card (T 020 001) is punched in accordance with instructions in the "1410/7010 Introduction", Vol. 1.00.

Reason for Change:

A problem existed in the routine to "Test for Erase Forward During Backspace After Write Status" under certain conditions.

1. When the length of tape erased was equal to the length of the record used in the test routine.
2. One pass of the test had been run and the first 1000 records on tape, written by the last routine run, all had labels of the form xxxx 00586*.

The following changes were made to T020B to create T020C: (All pages to which changes were made are dated 12/31/64)

1. The length of the second record written in the subject routine was changed from 586 characters to End of memory - 9400.
2. The tape record label used in all 586 character records (and End of Memory records) was redefined FROM: xxxx 00586* TO: xxxx 00586*.

Enclosures: 76 Pages

Card Deck for CARD ONLY SYSTEMS (as punched by UP51)

8 Cards - Card Loader (1-7) and 1 Core Clear

183 Cards No. 001 - 183 Data Cards

1 Card Execute Card

Distribution: X 1410 Tape
X 7010 Tape
Other

002
T020
1000

1003
T020
Page 001

T020C
TAPE OPERATIONS TEST
(1410/7010)
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T020
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4.00.00.0 TEST DESCRIPTION

.00.1 MODIFICATIONS

See Release Sheet description of changes from last level.

.00.2 DESCRIPTION

T020 tests magnetic tape operation instructions on a 1410 or 7010 Data Processing System. It is a test of electrical rather than mechanical operation.

The test covers three main areas:

- a. CPU channel circuitry, control and data lines to TAU.
- b. Tape Adapter Unit, control and data lines to drives.
- c. Tape Drive Write and Read circuitry.

These areas are by no means independent and are not completely testable separately. The test assumes that the CPU is functioning correctly and can at least decode a tape operation instruction.

Tape Units are tested sequentially, one channel at a time, on all channels. No simultaneous channel operation is performed. Overlap mode is used when the Overlap Feature is present. All tape instructions are then issued in overlap mode.

T020 can serve as a reliability test. Most instructions are used frequently enough to keep them under close surveillance.

The test is organized in building block fashion. Each block or section tests an additional area of tape operation. Each section is composed of one or more routines where each routine tests particular steps in the execution of the tape instruction. Although each routine depends on previously established operations, any routine can be run independently.

After each test routine, a monitor routine, labeled "MONITR", is entered to provide program control and report error conditions. (Refer to flow chart Page 013.)

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Page 004

4.00.00.0 TEST DESCRIPTION

.00.2 DESCRIPTION Continued

Almost all tape operations are performed through the use of utility Write, Read and Unit Control Routines. These utility routines generate the particular instruction requested, set up the data field, execute the instruction, test the channel status indicators and test for overlapped and non overlapped operation.

For additional information on the utility Write, Read and Unit Control routines refer to OPERATING HINTS and COMMENTS section 4.00.03.3.

Automatic error correction routines are used if manual intervention does not prohibit their execution. The analysis of the results of each tape operation is made in the test routine initiating the instruction, and failure to meet expected results is recorded.
(Refer to flow chart, page 015.)

T020 begins immediately on completion of loading. No manual intervention is required. The program types its identity and the identity of each tape unit it is testing as they are selected. Success or failure indications are typed following the tape unit's identity. At completion of the test, an end of job message is typed, and T020 branches to the load program.

.00.3 EQUIPMENT REQUIRED

Any model
1410 or 7010

With
729s Mod II, IV, V, VI and/or 7330s.
Attached through
1414 Mods. 1, 2, or 7.

The Console Printer is the only output device employed.

.00.4 CARD DECK

T020 in card form consists of:

7 Cards	Load Program
1 Card	Core Clear
Program Deck ¹	Program T020
1 Card	Execute card (TADS) (Branch to 2000)

NOTE: Program card #001 is a STANDARD SYSTEM CONTROL CARD. It does not have any control information punched in columns 13 - 44.

.00.5 EC LEVEL OF MACHINE

1414 - 252643 (Permits backspacing into load point)

.00.6 PROGRAM RUN TIME

Approximately 3 minutes per tape drive for 729s.

4.00.01.0 LOADING PROCEDURES

Standard 1410 Diagnostic Loading Procedure is used. Refer to "1410/7010 Introductory Material" for further information.

4.00.02.0 OPERATING PROCEDURE

.02.1 Rewind and set to READY status tape drives to be tested.
(All READY tape drives from number 1 to number 9 are tested.
Drive 0 is not tested on any channel.)

Set ASTERISK INSERT switch to ON.

T020 begins immediately on completion of loading. No manual intervention is required.

Tape drives are tested sequentially. Each drive is tested to conclusion before the next one is selected.

All drives to be tested need not be READY when the test is begun.
Additional tape units on a channel can be added in ascending sequence.

1. See Release Sheet for exact number of cards in program deck.

- .02.2 Program operation can be changed at any time using the "Program Alter Routine". TADs are loaded as blanks and TAD locations are only tested for 1.

The TADs used are:

Standard

<u>TADs</u>	<u>ADDR</u>	<u>NOT 1</u>	<u>1</u>
TAD0	01000	Do Not	Bypass Typeout
TAD1	01001	Do Not	Loop on Routine
TAD2	01002	Do Not	Halt on Error
TAD3	01003	Do Not	Repeat Program

Special

TAD4	01004	Do Not	Bypass Overlap Mode
TAD5	01005	Do Not	Halt after 1 I/O Operation
TAD6	01006	Do Not	Rewind Unload
TAD7	01007	Do Not	Perform LRCR Test
TAD8	01008	Do Not	Bypass Status Ind Typeout

T020 is run in overlap mode if the SYSTEM CONTROL CARD indicates the Overlap Feature is present. To change from overlap mode to unoverlap mode or from unoverlap to overlap mode, T020A must be restarted from 2000 after TAD4 is changed.

Setting TAD6 to 1 causes all the tape drives to rewind and unload (instead of just rewinding) after all the drives on a channel are tested.

To run the "LRCR Test" routine, set TAD7 to 1. The routine is run the first time it is encountered after TAD7 is set. It is then bypassed until the next channel is tested. For additional information on running the "LRCR Test" routine, refer to OPERATING HINTS & COMMENTS, section 4.00.03.5.

Setting TAD8 to 1 bypass Status Indicator Error typeouts only.

1. Longitudinal Redundancy Check Register (LRCR)

4.00.03.0 OPERATING HINTS AND COMMENTS

- .03.1 T020 tests all tape drives and channels that are READY (except drive C). To bypass a tape drive or channel, RESET the drive to Not READY or turn the TAU to OFF LINE. The same method is used to terminate operations on a drive or channel while the test is in progress. Caution is advised as resetting the drive status may cause the TAU to hang up. Resetting the drive (status) is safest in rewind status or while the console printer is typing. Several successive RESET-START operations may be necessary to "drop" a drive.
- .03.2 Drives are tested sequentially. After each drive is tested the drive number is set in a table, but it is not typed. The table is available for display at locations 00010 to 00019. Locations 00020 to 00024 contain the channels tested. These locations are labeled "RDYTDS" and "CHANOS" respectively.

Much additional and useful information is available in the index registers (X), (locations 00025 to 00099). It is organized in the following manner:

X	ADDR	LABEL	CONTENTS
1	00025	SXR1	Address - Next routine
2	00030	SXR2	Address - Last routine
3	00035	RETURN	Address - Return to test routine
4	00040	DATA	Address - Data field for Write
5	00045	RECLEN	Record length, Write & Read fields
6	00050	BBBBB	B. - Address, Indexed Write & Read
7	00055	XAREOT	B, E, F, G, H address after Write/Read
8	00060	SXR3	Used
9	00065	SXR4	in
10	00070	SXRA	utility
11	00075	SXRB	routines.
12	00080	-----	Not used.
13	00085	TDIND	T. D. number in Ready Table .
14	00090	CHIND	Channel number in Channel Table.
15	00095	CHSTCT	Position in table of channel constants.

The only input-output area is labeled BUFER and occupies locations 09400 to 09986.

.03.3 Most of the tape operations are performed through the use of Write, Read and Unit Control Routines. Each of the Write, Read and Unit Control Routines has multiple points of entry. The label of the entry to a routine determines the tape operation that is performed in the routine. The labels are the same as the Autocoder mnemonics of the tape instruction to be executed. Specifically, the labels of the points of entry, and therefore the operation performed in the routine are:

RWD, BSP, WTM, SKP	The Unit Control Routine
WT, WTB, WTW, WTBW, WTBEW	The Write Routine
RT, RTB, RTW, RTBW, RTBGW	The Read Routine
(The O is not used to indicate overlap mode)	

For example:

1. B WTM

causes a Write Tape Mark instruction (UxUnM) to be set in the Unit Control Routine and executed.

2. B RTBW

causes a Tape Read instruction in odd parity, load mode, (LxBnbbbbR), to be set into the Read Routine and performed.

The Write Routine requires that the branch to it be followed by a constant that is the address of a data field. The constant can be signed or unsigned. The Write Routine moves the data from the address specified to the common input-output area (labeled "BUFER"). The sign of the data address indicates the size of the output data field in the "BUFER".

CONSTANT	SIZE OF DATA FIELD
Unsigned	10 Characters
Signed minus (-)	64 Characters
Signed plus (+)	586 Characters

In each case, a group mark-word mark is placed immediately to the right of the last character of the data field in the "BUFER".

The 586 character records are composed of nine multiples of the 64 character data field addressed and a ten character record label. The record label contains the record number and the record length and is separated from the rest of the data field by a record mark (#). A typical record label is 064900586#. This is record number 649 and is 586 characters long.

The utility Write, Read and Unit Control Routines return control to the test routine from which they were entered after the operation is successfully completed. (Refer to Flow Chart, page 014.)

4.00.03.0 OPERATING HINTS AND COMMENTS Continued

.03.4 Setting TAD5 to 1 causes a halt after each tape operation. The halt is located at a point where the Read, Write and Unit Control subroutines merge into a common routine. (Refer to flow chart, page 014.) This makes it possible to display the input-output area, indicators, address registers, etc. immediately after the operation is performed. (Preliminary setups can be performed at machine speed.)

NOTE: The halt occurs after each tape operation, Unit Control operations included. Wait for the console READ or WRITE light to be on before displaying the input-output area.

.03.5 Pressing INQUIRY REQUEST before START on the Read phase of the "LRCR Test" routine causes a STOP after reading the first character. Setting TAD5 to 1 causes a STOP after each of the succeeding read operations. This permits a visual inspection of the TAU's CHECK register, LRCR REG and VRC REG.

.03.6 In addition to the tests for inquiry requests (BNQs) strategically located in the program, a "BNQ" is placed within the "Program Alter Routine" itself. This permits altering more than one area of the program at one time without returning to a test routine to await the next "BNQ". To accomplish this, hold down INQUIRY REQUEST while pressing INQUIRY RELEASE.

4.00.04.0 PROGRAM STOPS AND RESTARTS

.04.1 STOPS

All programmed stops are under TAD control and occur only on request.¹

Setting TAD2 to 1 causes a halt on program detected errors. The halt is located in the "Error Control Routine" and is the only error halt used. It occurs after the error typeout and before any automatic action is taken on the error.

A STOP under control of TAD5 is provided to assist in machine debugging. Its use is explained in OPERATING HINTS & COMMENTS, section 4.00.03.4.

-
1. There are two unique STOPS not directly under TAD control. The STOPS are in the "LRCR Test" routine following messages to set density switches. The routine is optional and under TAD control. The STOPS occur only when the "LRCR Test" routine is run.

.04.2 PROGRAM RESTARTS

After all STOPs, START causes the test to resume with the next sequential instruction. COMPUTER RESET and START returns the test to the start of the test routine in progress or the last test routine run before resetting. After the test is completed and "EOJ" is typed, COMPUTER RESET and START begins the test again at 2000.

4.00.05.0 TYPEOUTS

.05.1 NORMAL OR NON-ERROR TYPEOUTS

T020A Test Identification - typed once at the start of the test.
It is not retyped.

TU xx Tape Unit Identification - channel and drive number of unit being tested. e.g. TU 12 Channel 1, Drive 2.

PASS Pass Complete - typed only on completion of all test routines on the selected tape unit.

.05.2 ERROR TYPEOUTS

All typeouts preceded by asterisks are error indication and are under TAD control. 2.

Error timeouts are in four classes.

1. Reporting some Status Indicator set during operation when it should not have been (or was not expected.)
2. Reporting a failure to meet some predetermined condition, i.e., data fields fail to compare, an expected Status Indicator not set, address register at end of transfer not as expected, etc.
3. A "Not Ready", (1), indication or three successive errors in the first two routines (ERROR 01-ERROR 09) causes the testing of the drive to be terminated. This action is reported following the error timeout.
4. The B-register bit pick up and A-register drop-out test reports results in summary form. Only non zero totals are typed out.

-
1. Not including "LRCR Test" routine which is optional.
 2. The summary timeouts of Class 4 are not under TAD control.

4.00.05.0

TYPEOUTS (Continued)

Illustrations and explanations of error typeouts:

1. Status Indicator Set

* M%BL09400W 4 05000
a b c

- a. Instruction issued - Write
- b. d-character bit of test and branch instruction used to test indicator -4- Data Check
- c. Starting address of routine in progress.
To repeat routine ADDRESS SET to this address. 1.

2. Some expected condition not met:

* ERROR 35 06000
a b

- a. Error indication and code number for the condition not met. Refer to the program listing for explanation. (In the listing the error number is the label of a Set Word Mark instruction.)
- b. Starting address of routine.
To repeat routine ADDRESS SET to this address. 1.

3. Testing of tape drive terminated prematurely:

* DROPPED

4. The B-register bit pick up and A-register drop out test reports results in the manner:

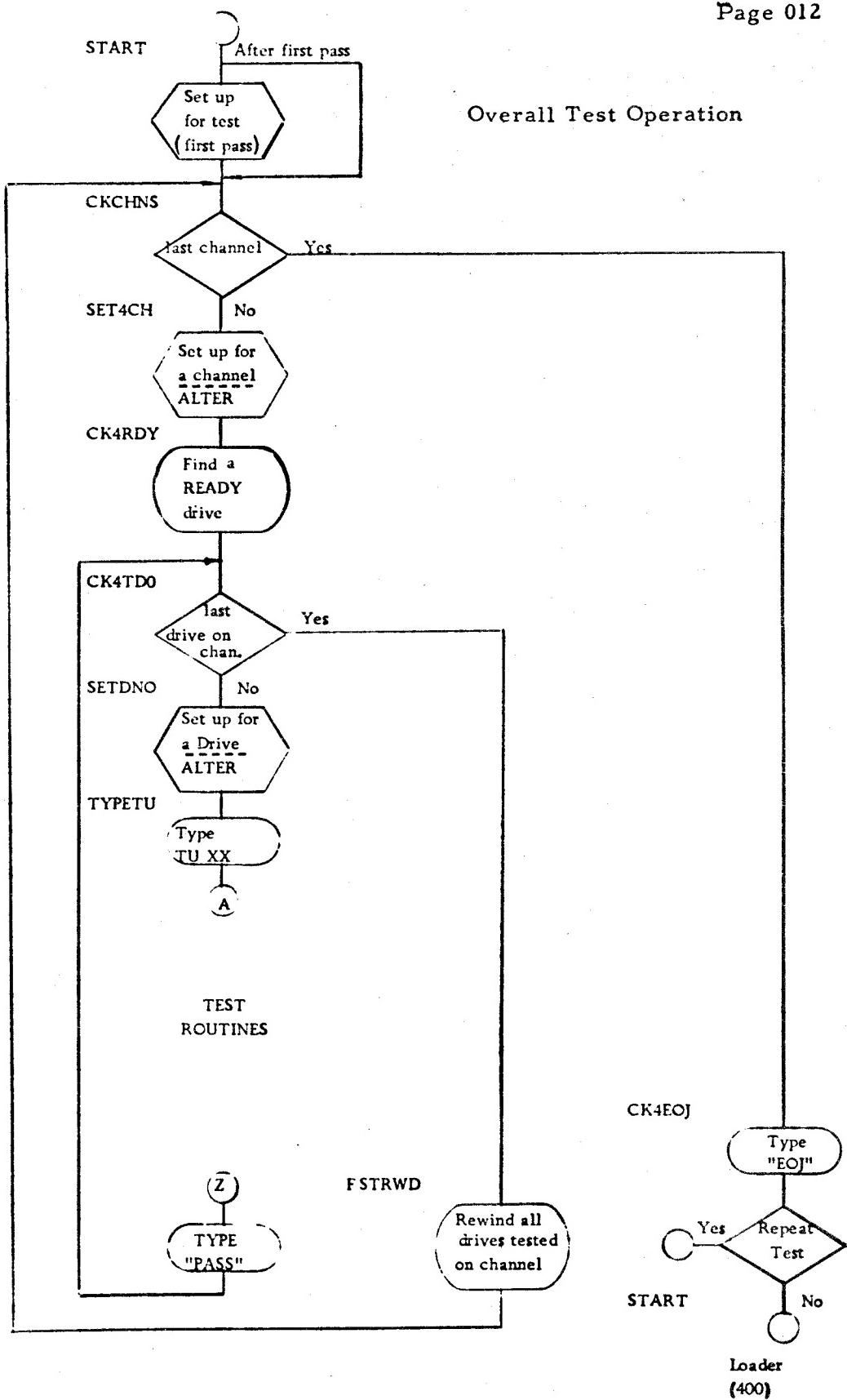
*B 0325
*C-0980
* 1-1000
ab c

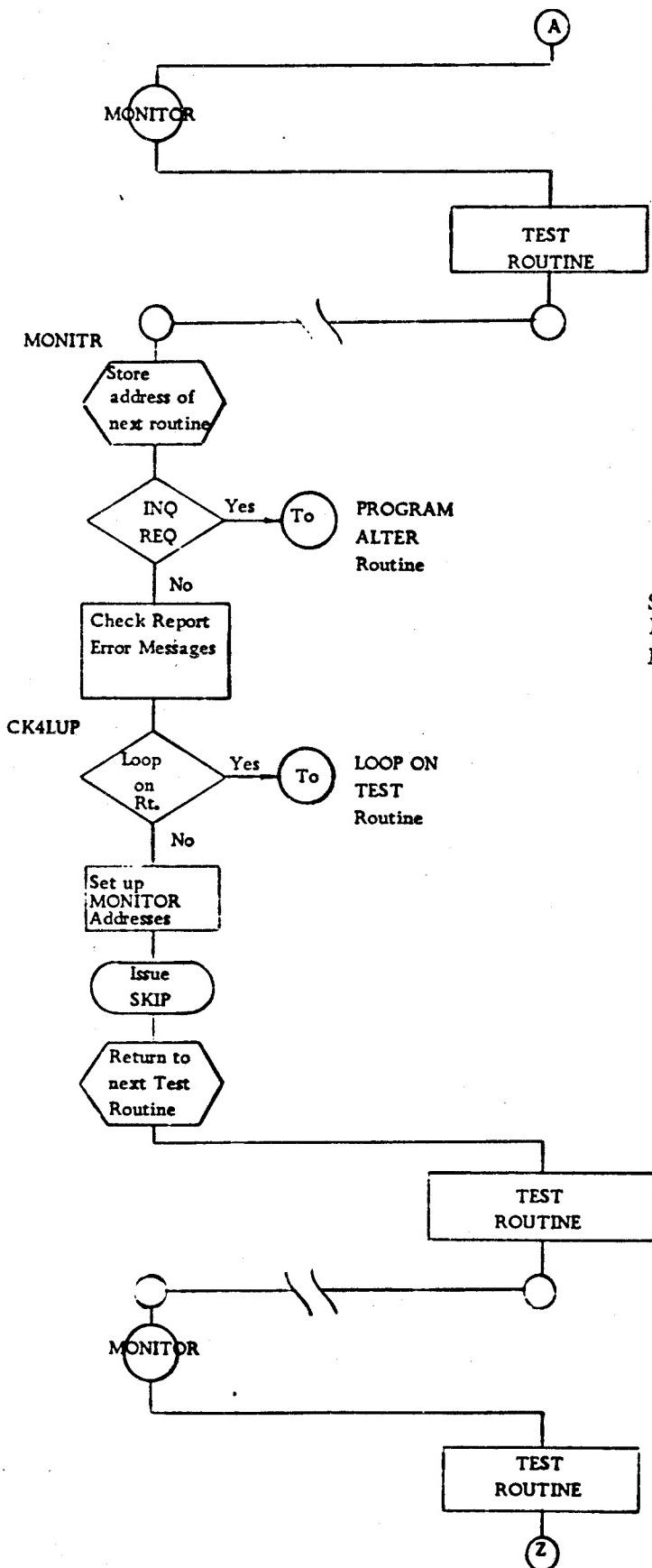
- a. Indicates bit (1248ABC).
- b. Blank indicates bits picked up; hyphen, (-), indicates bits dropped.
- c. Indicates number of bits picked up or dropped.

1. RESET-START can be used when TAD2 is set to STOP on error.

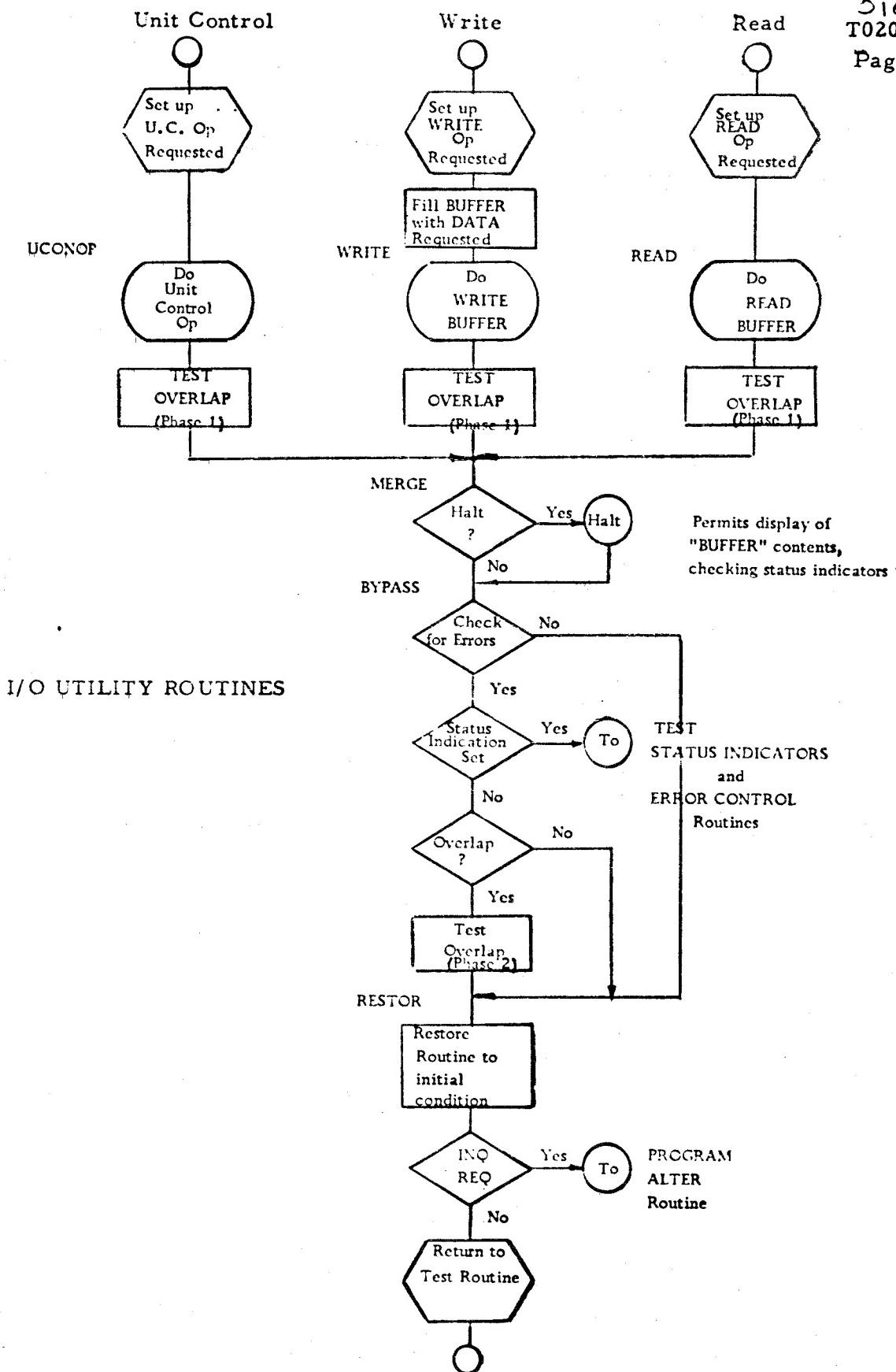
TAPE OPERATIONS TEST

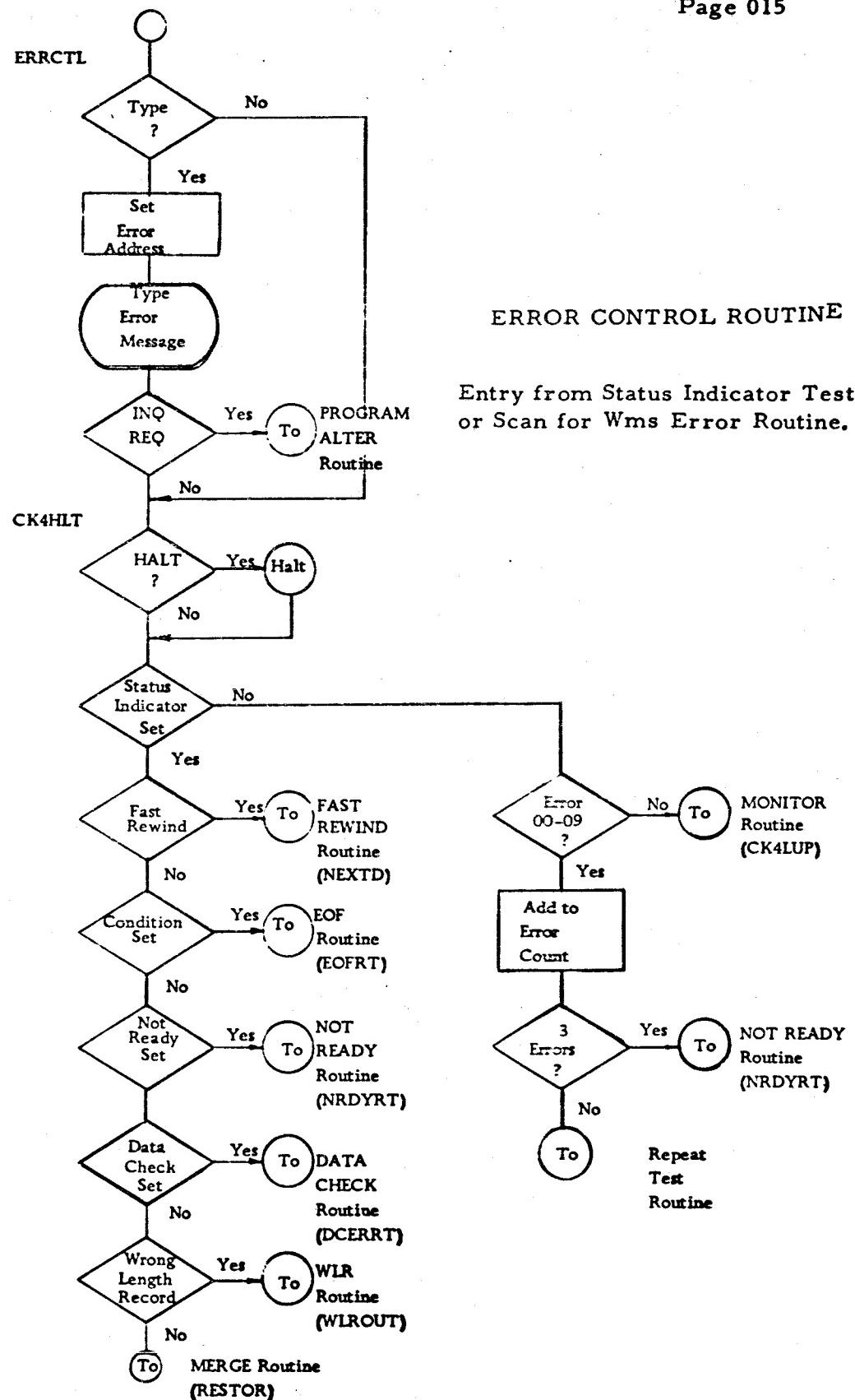
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Sequence of Test
Routines and common
MONITOR Routine





518
TO20
7-29-16

TAPE OPERATIONS TEST

LABEL OPCOD OPERAND

CTL	2
LINES	36
LOADER	EQU 400

* * *
 ASSIGN LABELS TO INDEX REGISTERS AND
 LOCATIONS IN STORAGE

CHSTCT	EQU 15,X	COUNT FOR CHAN SET UP
CHIND	EQU 14,X	INDICATES CHANNEL NUMBER
TDIND	EQU 13,X	DRIVE NUMBER IN READY TABLE
SXRB	EQU 11,X	UTILITY INDEX REG
SXRA	EQU 10,X	UTILITY INDEX REG
SXR4	EQU 9,X	UTILITY INDEX REG
SXR3	EQU 8,X	UTILITY INDEX REG
XAREOT	EQU 7,X	B/E/F/G/H ADDR AFTER READ/WRITE
BBBBBB	EQU 6,X	B-ADDR FOR INDEXED READ/WRITE
RECLEN	EQU 5,X	RECORD LENGTH
DATA	EQU 4,X	ADDR OF DATA FIELD
RETURN	EQU 3,X	ADDR OF RETURN TO TEST RT
SXR2	EQU 2,X	ADDR OF LAST ROUTINE - MONITR
SXR1	EQU 1,X	ADDR OF NEXT ROUTINE - MONITR

RDYTDS	EQU 10	TABLE OF READY IDS
CHANOS	EQU 20	CHANNELS AVAILABLE
WKAREA	EQU 163	WORK AREA
BUFER	EQU 09400	INPUT-OUTPUT AREA
BUFER1	EQU BUFER€10	
BUFER2	EQU BUFER€74	LOC OF FIRST CHAR OF
BUFER3	EQU BUFER€138	
BUFER4	EQU BUFER€202	A GROUP, IN A RECORD
BUFERS	EQU BUFER€266	
BUFER6	EQU BUFER€330	MADE UP OF MULTIPLES
BUFER7	EQU BUFER€394	
BUFER8	EQU BUFER€458	OF A GROUP & A LABEL
BUFER9	EQU BUFER€522	
BUFRND	EQU 09985	LAST CHAR IN BUFER

TAPE OPERATIONS TEST

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CT ADDRS INSTRUCTION

LABEL	OPCODE	OPERAND						
*		*****	STANDARD TADS	*****				
	ORG	01000	NOT 1	1				01000
TAD0	DC	a a	DO NOT	BYPASS TYPE OUTS				1 01000
TAD1		a a	DO NOT	LOOP ON ROUTINE				1 01001
TAD2		a a	DO NOT	HALT ON ERRORS				1 01002
TAD3		a a	DO NOT	REPEAT PROGRAM				1 01003
*		*****	SPECIAL	TADS	*****			
TAD4		a a	DO NOT	BYPASS OVERLAP MODE				1 01004
TAD5		a a	DO NOT	HALT AFTER 1 I/O OP				1 01005
TAD6		a a	DO NOT	REWIND UNLOAD				1 01006
TAD7		a a	DO NOT	PERFORM LRCR TEST				1 01007
TAD8		a a	DO NOT	BYPASS STATUS IND TYPEDOUT				1 01008
GWM	DCW	G	DATA					1 01009
*			*** PROGRAM SET UP IN NOT 1 CONDITION ***					
*			AND WILL ONLY TEST FOR 1					
*			PROGRAM ALTER ROUTINE					
CONTROL	CTLXITES		STORE RETURN ADDRESS					7 01010 G 01084 B
ENTER	RCP	ADDRESS	ENTER LOCATION TO BE ALTERED					10 01017 M Z10 01052 R
		ENTER	TRY AGAIN IF 1/2/4/8					7 01027 R 01017 M
			INQ NOT FROM CONSOLE					7 01034 R 01079 S
								7 01041 R 01048 M
ADDRESS	RCPW	00000	ENTER DATA INTO ADDRESS SPECIFIED					10 01048 L Z10 00000 R
		ENTER	ADDRES\$					7 01058 R 01048 S
								7 01065 R 01072 M
								7 01072 J 01017 Q
CTLXIT		6	00000					7 01079 J 00000
*			*****					

TAPE OPERATIONS TEST

T020
CT ADDRS INSTRUCTION

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
	ORG	1230			CONTROL INFORMATION
	DC	a	a		SEQ# 201 10K SYS1 ONLY
	DC	20101012			
TSTID	DCW	210202a			TEST IDENTIFICATION
LEVEL	C	2Ca,C			SUFFIX LEVEL
SYS1	ORG	1256			*SYSTEM CONTROL CARD
	DC	a a			INDICATE SYSTEM TYPE
			O	1	1410 STD
			I	1	1410 ACC
			X	1	7010
					INDICATE SYSTEM SIZE
				0-10,1-20,3-40 K	
				5-60,7-80,9-100 K	
			a	a	NOT INTERROGATED
			a	a	1-SYSTEM HAS OVERLAP
			a	a	NOT INTERROGATED
			a	a	1-SYSTEM HAS CHAN 2
			a	a	1-SYSTEM HAS CHAN 3
			a	a	1-SYSTEM HAS CHAN 4
			a	a	NOT INTERROGATED
			a*a		*****
	ORG	1086			
C00009	DCW	200009a			LENGTH OF DATA FIELD
C00010	DCW	200010a			LENGTH OF DATA FIELD
C00064	DCW	200064a			LENGTH OF DATA FIELD
C00586	DCW	200586a			LENGTH OF DATA FIELD
C09410	DCW	209410a			ADDR REG AFTER 10 CHARS
C09411	DCW	209411a			ADDR REG AFTER 11 CHARS
C09465	DCW	209465a			ADDR REG AFTER 64 CHARS

*CONSTANTS,COUNTERS & SWITCHES

01086				
01090				
01095				
01100				
01105				
01110				
01115				
01120				

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
ZERO	EQU	00000			BASE FOR INDEXD R/W
BPRIME	DCW	ZEROCB00000			INDEXED R/W ADDRESS
EDMAN1	DCW	09999	5	01125	00*-0
WTEADR	DCW	09990	5	01130	END OF MEMORY ADDRESS
			5	01135	END OF MEMORY-10
LERROR	DCW	2ERROR2			
ALLIND	DCW	312488BA2			ALL STATUS IND
WMERCT	DCW	302	5	01140	
DCCNT	DCW	302	6	01146	ERROR COUNT
WLRCNT	DCW	302	1	01147	DATA CHECK COUNTER
			1	01148	WLR COUNT
RECNT1	DCW	0000			RECORD COUNT
RECNT2	DCW	0000	4	01153	COUNT TO FIND LABEL
HOLDIT	DCW	00000	4	01157	SAVE ADDRESS
HAFDUN	DCW	DROPDC	5	01162	
BPUCNT	DCW	00000	5	01167	08627
COUNT0	EQU	DUMMY-6	5	01172	BIT PICK UP COUNT
SAVEIT	DCW	0000	4	01176	A FIELD OF 4 ZEROS
			4	01176	SAVE RECORD NUMBER
TIME1	DCW	06			LOOP TIME FOR SPACE,1 SEC ON T010
DLACNT	DCW	0000000	2	01178	TIME TO TURN ON T.I.
DELAY1	DCW	0000000	6	01184	
TISH	DCW	a a	6	01190	SWITCH LOCATIONS
OIPSW	DCW	a a	2	01192	OVERLAP INDICATOR
			2	01194	
EWTFTPC	DC		5	01199	TEST PATTERN SEQUENCE
EWTFTPB	DCW		5	01204	EWTFTPB
EWTFTPA	DCW		5	01209	FOR A WRITE TRIGGER FREQUENCY
EWTFTP8	DCW		5	01214	EWTFTP8
EWTFTP4	DCW		5	01219	TEST ROUTINE. PATTERNS ARE
EWTFTP2	DCW		5	01224	09080
FREQ1	DCW		5	01229	09016
	ORG	1289	01289	08952	

TAPE OPERATIONS TEST

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CT ADDRS INSTRUCTION

* INSTRUCTION ALTERATION ROUTINE
 * OP CODES, X-CONTROL FIELDS & D MODS
 * ARE ALTERED ACCORDING TO CHAN REQ

LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
I-A-R	SBR	SXRA	7	01289	6 00074 B
	MLNA	4ESXRA, SXRB	12	01296	D 00..4 00079 /
IARSCN	SCNLB	09990, 0ESXR8	12	01308	D 09990 00.M0 -
	SBR	SXRB	7	01320	G 00079 B
C	SXRB, 9ESXRA	BAR IS B FIELD WM-1	7	01327	C 00079 00..9
BH	14ESXRA	CHECK FOR STOP ADDR.	11	01338	J 00..J4 U
MLCS	1ESXR8,*E12	STOP ADDR. IS HIGHER	7	01345	D 00..M1 01368 3
BCE	IARIOP, IARUPS, 0	MOVE CHAR TO TEST IT	12	01357	B 01393 01503 0
BCE		I/O OP CODE	1	01369	B
BCE		CHECK CHAR UNDER WM	1	01370	B
BCE		IS IT ONE IN TABLE	6	01371	B 01424
BCE	IARCSI	CHAN STATUS IND OP	1	01377	B
BCE		IF SO GO CHANGE IT	1	01378	B
BCE		IF NOT KEEP LOOKING	1	01379	B
BCE	IARJOP	J OP, CK FOR OIP D-CH	6	01380	B 01443
B	IARSCN	SCAN TO NEXT WM	7	01386	J 01308
IARIOP	MLNS	13ESXRA, 4ESXR8	12	01393	D 00..J3 00..M4 1
	MLCS	10ESXRA, 2ESXR8	12	01405	D 00..JO 00..M2 3
B	IARSCN	ALTER X1,CHAN-MODE	7	01417	J 01308
	MLCS	GO	12	01424	D 00..J1 00..M1 3
IARCSI		ALTER STATUS IND OP	7	01436	J 01308
B	IARSCN	J OP,CK FOR OIP D-CH	12	01443	D 00..M7 01466 3
IARJOP	MLCS	MOVE D-CH TO TEST IT	12	01455	B 01477 01507 0
BCE	IARBOL, IARDIS, 0	CHECK D-MOD CHAR	1	01467	B
BCE		IS IT ONE	1	01468	B
BCE		OF D-CHARS USED TO	1	01469	B
BCE		TEST FOR OL IN PROC	7	01470	J 01308
B	IARSCN	ALTER BOL D-MOD CHAR	12	01477	D 00..J2 00..M7 1
IARBOL	MLNS	12ESXRA, 7ESXR8	7	01489	J 01308
B	IARSCN	OP CODES SCANNED FOR	8	01503	
IAROPS	DCW	D-MODS TO TEST UP	4	01507	
IARDIS	243213				

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
*		CHANNEL CONSTANTS FOR ALTER ROUTINE-			
*		CHAN OP CHAR- UNOVERLAP AND OVERLAP,			
*		CHAN STATUS INDICATOR OP CODE,			
*		CHAN BRANCH ON OLAP TEST D-MOD CHAR			
CHCON	DC	02R1a	3	01508	CHANNEL 1
	DCW	33a	1	01511	OVERLAP
	DC	00X2a	3	01514	CHANNEL 2
	DCW	a*3	1	01515	OVERLAP
	DC	Q	3	01518	CHANNEL 3
	DC	AM33a	1	01519	OVERLAP
	DCW	a\$e	3	01522	CHANNEL 4
	DC	a'14a	1	01523	OVERLAP
	DCW	a#a			
GOPDS	DCW	0EFGHa	4	01524	D MODS FOR G CCCCC X

*		*	SET UP FOR CHANNEL TO BE TESTED		

SET4CH	S	CHSTCT	6	01528	ZERO CH STATUS COUNT
	S		1	01534	ZERO CHAN COUNTER
CKCHNS	BCE	CK4EOJ,CHAN0\$ECHIND, LAST CH ON SYSTEM	12	01535	B 06603 00MK0
MRC	BCE	CHCONECHSTCT,CHSTAT SET CH CONS IN ALTER RT	12	01547	D 01EM8 01798 #
BCE	MRC	UPSTCT,TAD4,1 UN-OVERLAP OPERATION	12	01559	B 01613 01004 1
MRC	MLCS	CHCONE3ECHSTCT,CHSTAT OVERLAPPED OP	12	01571	D 01EA1 01798 #
MLCS	CW	CHCONE3ECHSTCT,TESTX111 XI CHAR FOR OL	12	01583	D 01EA1 01706 3
CW	AREOTO	DONT G CCCCC D YET	6	01595	□ 07917
MLCS	UPSTCT	GOPDSECHIND,AREOTOG6 SET D MOD CHAR	12	01601	D 01EK4 07923 3
A	FOUR,CHSTCT	UP COUNTER BY 4	11	01613	A 08701 00049
MLNS	CHAN0\$ECHIND,TUIDNO-1	SET CH # IN TAPE UNIT I.D.	12	01624	D 00MK0 01831 1
A	ONE,CHIND	UP 1 FOR NEXT CHAN	11	01636	A 08681 00094
MLCS	CHSTAT,CKDRIVE1	SET UP WRITE INSTRUCTION	12	01647	D 01798 01735 3
MLCS	CHSTATE1,CKDRIVE10	SET UP D-MOD FOR NOT RDY TEST	12	01659	D 01f9' 01744 3
SW	LRCRCK1	SLT TO RUN LRCR TEST ON 1 DRIVE	6	01671	, 02406

TAPE OPERATIONS TEST

CT ADDRS INSTRUCTION

LABEL OPCODE OPERAND

CHECK FOR READY DRIVES ON A CHANNEL

CK4RDY	S	RDYTD\$9	READY TABLE TO ZEROS	6 01677 S 00019
	S		ZERO TAPE DRIVE NO	1 01683 S
	S	TDIND	ZERO TAPE DRIVE CNIR	6 01684 S 00089
	CW	CK4TDO\$1	SET SWITCH	6 01690 □ 01708
NEXTDR	A	ONE,ATDNO	ADD 1 TO TD UNIT NO	11 01696 A 08681 00009
CK4TDO	NOPWM			1 01707 N
BZ	FSTRWD	ALL DRIVES ON CHAN TESTED,RWD ALL		7 01708 J 06646 V
BZ	CKCHNS	CHECK FOR NEXT CHANNEL		7 01715 J 01535 V
MLNS	ATDNO,UNITNO	MOVE DRIVE NUMBER TO WRITE OP		12 01722 D 00009 01737 1
WT	10,BUFER	TRY TO WRITE A RECORD		10 01734 M *UO 09400 W
BNR1	NEXTDR	NOT RDY,SKIP IT		7 01744 R 01696 1
MLNS	UNITNO,TDNO	SET TD NO TO ALTER TO		12 01751 D 01737 01801 1
MLNS	UNITNO,TUDNO	SET TAPE DRIVE # IN TIMEOUT		12 01763 D 01737 01832 1
SW	CK4TDO\$1	SET SWITCH		6 01775 , 01708

ALTER INSTRUCTIONS FOR DRIVE SELECTED

ALTER	B	I-A-R	ALTER FOR CH REQUEST	7 01781 J 01289
	DCW	UPREND	ADDR. TO START SCAN	5 01792 08585
		TDNO	ADDR. TO STOP SCAN	5 01797 01801
CHSTAT	DC	ⓐ ⓑ	I/O SPECIFIC MODE	1 01798
		ⓐ ⓑ	CH-STATUS IND OP CDE	1 01799
	DCW	ⓐ ⓑ	D-MOD TO TEST OVRAP	1 01800
TDNO	DCW	aoa	X-CIRL FIELD POS 3	1 01801
BA1	*E1		RESET INTERLOCK	7 01802 R 01809 G
RWD	10		REWIND DRIVE	5 01809 U *UO R G
BA1	*-11		TRY AGAIN ON ANY INDICATOR	7 01814 R 01809 G
TUDNO	B	TYPEIT	TYPE TAPE DRIVE IDENTIFICATION	7 01821 J 09344
	DCW	@TU 002,G	TAPE UNIT IDENTITY	5 01832
	B	BEGIN	BEGIN TEST ROUTINES	7 01834 J 02015

*MONITOR ROUTINE

```

MONITR    SBR      SXRI     RETURN ADDRESS
BAI      *E1      RESET I/O INTERLOCK
BNQ      CONTRL   TO PROGRAM CONTROL ROUTINE
B       CK4WMS   CHECK FOR ERRORS
CK4LUP   NOPWM
B       UPDATE&12 BYPASS LOOP CHECK
BCE     WHICH1,TAD1.1 CHK FOR LOOP ON ROUT
B       UPDATE BYPASS LOOP CHECK
C       SXRI,SXR2 COMPARE ROUT ADDRS
WHICH1  SW       LRCRCK&1 SET TO LOOP ON LRCR CKS
BL      0ESXR2   LOOP ON ROUTINE
MLNB   SXRI,SXR2 SET ADDR FOR LOOP RT
CH     CK4LUPE&1 RESTORE LOOP ON RT
S       WMERCT  ZERO ERROR COUNT
B       SKP     TO SKIP/ERASE ROUTINE
UPDATE  H       RETURN
        0ESXRI  DEFINE PRECEDING BRANCH LENGTH
        *****
        *****

ORG     2000  PROGRAM STARTS HERE
START   NOP    02000
        1 02000 N
REPEAT  B      SETUP  INITIALIZATION
        B  SE14CH SET UP FOR A CHANNEL
        THEN SET UP FOR A DRIVE
BEGIN   NOP    BEGIN TEST ROUTINES
        1 02015 N

* TEST DRIVES SEQUENTIALLY AS THEY ARE FOUND READY
* DRIVE SHOULD BE AT L.P. OR ON WAY TO L.P.
* AFTER REMANDING

```

TAPE OPERATIONS TEST

CT ADDRS INSTRUCTION

* TEST REWIND OPERATION
RWD AT LP-SPACE FORWARD-RWD TO LP

LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
B	MONITR		7	02016	J 01841
B	RWD		7	02023	J 06875
RWD	11		5	02030	U ZUL R
ERROR 01	SW	ERRO1 *E7	6	02035	* 00202
	BCB1	ERKO1	7	02041	R 02054 2
CW			6	02048	□ 00202
B	MONITR		7	02054	J 01841
CU	ZUL,A		5	02061	U ZUL A L
BEX1	*E8,B		7	02066	R 02080 B
BA1	*-18		7	02073	R 02061 H
CW	RWD\$WE1		6	02080	□ 02092
RWD3	RWD 11		5	02086	U ZUL R
RWD\$W	NOPWM		1	02091	N
B	RWD\$BY		7	02092	J 02124
SW	RWD\$WE1		6	02099	* 02092
BCB1	RWD3		7	02105	R 02086 2
ERROR 02	SW	ERK02	6	02112	* 00203
ERROR 03	SW	ERRO3 *E14,B	6	02118	* 00204
RWD\$BY	BEX1		7	02124	R 02144 B
BA1	RWD3		7	02131	R 02086 H
CW	ERRO3		6	02138	□ 00204
RWD4	RWD 11		5	02144	U ZUL R
	BCB1	*E7	7	02149	R 02162 2
ERROR 04	SW	ERRO4	6	02156	* 00205
B	MONITR		7	02162	J 01841
RWD5	B	RWD	7	02169	J 06875
RWD6	RWD	11	5	02176	U ZUL R
ERROR 05	SW	ERR05	6	02181	* 00206
	BCB1	*E7	7	02187	R 02200 2
CW	ERR05		6	02194	□ 00206

*TEST BACKSPACE OPERATION
BSP AT LP-SPACE FORWARD-BSP

BACKSPACE MOVES TAPE BACKWARD - STOPS AT 1 P

TAPE OPERATIONS TEST

OPCODE OPERAND

• TEST WRITE TAPE MARK OPERATION

WTM-SPACE, TEST FOR TI ON, TURN TI OFF

LABEL	CT	ADDRS	T020	PAGE INSTRUCTION
B	MONITR			
BTI	*61		7 02373 J 01841	
B	WTM		7 02380 J 02387 K	
B	BSP		7 02387 J 06913	
B	SPACE		7 02394 J 06894	
BW	*67,TISW		7 02401 J 06792	
ERROR 10	SW	ERR10	12 02408 V 02426 01192 1	
ERROR 11	SW	ERR11	6 02420 * 00211	
BRI	*67		6 02426 * 00212	
CW	ERR11		7 02432 J 02445 K	
			6 02439 □ 00212	

• TEST SPACE OPERATION

SHOULD SPACE OVER ONE RECORD ONLY

LABEL	CT	ADDRS	T020	PAGE INSTRUCTION
B	MONITR		7 02445 J 01841	
B	WT		7 02452 J 07027	
DCW	TENGMS		5 02463 08680	
B	WTM		7 02464 J 06913	
B	BSP		7 02471 J 06894	
B	BSP		7 02478 J 06894	
B	SPACE		7 02485 J 06792	
BW	*67,TISW-1		12 02492 V 02510 01191 1	
ERK12			6 02504 * 00213	
B	SPACE		7 02510 J 06792	
BW	*67,TISW		12 02517 V 02535 01192 1	
ERR13	SW		6 02529 * 00214	

SPACE MOVES OVER ONLY ONE RECORD

LABEL OPCODE OPERAND

CT ADDRS INSTRUCTION

* • TEST ERASE/SKIP OPERATION

B	MONITR		7	02535	J 01841
B	WTM	WRITE TM	7	02542	J 06913
B	WTM	WRITE TM	7	02549	J 06913
B	SKF	TO SKIP/ERASE ROUTINE	7	02556	J 06932
B	WTM	WRITE ANOTHER TM	7	02563	J 06913
B	BSP		7	02570	J 06894
B	BSP		7	02577	J 06894
B	BSP		7	02584	J 06894
B	SPACE	SPACE OVER TM	7	02591	J 06792
BW	*67,TISW	T.I. SENSED	12	02598	V 02616 01192 1
ERROR 14 SW	ERR14		6	02610	*
B	SPACE		7	02616	J 06792
BW	*67,TISW		12	02623	V 02641 01192 1
ERROR 15 SW	ERR15		6	02635	*
MLNA	DLACNT,DELAY1	SAVE DELAY 1 COUNT	12	02641	D 01184 01190 1
A	DELAY1	DOUBLE DELAY COUNT	6	02653	A 01190
A	DLACNT,DELAY1		11	02659	A 01184 01190
B	SPACE	SPACE OVER 2ND TM	7	02670	J 06792
BW	*67,TISW	T.I. SENSED	12	02677	V 02695 01192 1
ERROR 16 SW	ERR16		6	02689	*
C	DELAY1,DLACNT	COMPARE TIME INTERVAL	11	02695	C 01190 01184
BH	*67		7	02706	J 02719 U
ERROR 17 SW	ERR17		6	02713	*

		SKIP/ERASE WORKS			

TAPE OPERATIONS TEST

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LABEL	OPCODE	OPERAND	CF	ADDRS	INSTRUCTION
*	*	*TEST STATUS INDICATORS AND ODD PARITY LATCH READ TM EVEN PARITY, TEST FOR EOF			
B	MONITR		7	02719	J 01841
B	WTM	WRITE A TAPE MARK	7	02726	J 06913
B	BSP	BSP OVER TM	7	02733	J 06894
SW	BYPASSC1	DO ERROR CHECKING HERE	6	02740	* 07651
B	RT	RD TM M XBN BUFFER R	7	02746	J 07420
B	BEF1 *E7	CONDITION SET, OK	7	02753	R 02766 8
ERROR	20	SW ERR20	6	02760	* 00221
B	BWL1 *E7	HLR SHOULD BE SET	7	02766	R 02779 -
ERROR	21	SW ERR21	6	02773	* 00222
B	BEX1 *E8,X	ANY OTHER IND SET	7	02779	R 02793 X
B	*E7		7	02786	J 02799
ERROR	22	SW ERR22	6	02793	* 00223
*	*	*****			
*	*	READ TM ODD PARITY, TEST FOR EOF & DC ALSO 1ST TEST OF ODD RED LATCH			
B	MONITR		7	02799	J 01841
SW	AREOTO	SAFE TO STORE E NOW	6	02806	* 07917
B	WTM	WRITE A TAPE MARK	7	02812	J 06913
B	BSP	BSP OVER TM	7	02819	J 06894
SW	BYPASSC1	DO ERROR CHECKING HERE	6	02826	* 07651
B	RTB	RD TM M XBN BUFFER R	7	02832	J 07438
B	BEF1 *E7	CONDITION SET, OK	7	02839	R 02852 8
ERROR	23	SW ERR23	6	02846	* 00224
B	BWL1 *E7	HLR SHOULD BE SET	7	02852	R 02865 -
ERROR	24	SW ERR24	6	02859	* 00225
B	BER1 *E7	DC SHOULD BE SET	7	02865	R 02878 4
ERROR	25	SW ERR25	6	02872	* 00226
B	BEX1 *E8,T	TEST FOR ANY OTHERS	7	02878	R 02892 T
ERROR	26	SW ERR26	6	02892	* 00227
*	*	*****			

TAPE OPERATIONS TEST

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CT ADDRS INSTRUCTION

LABEL	OPCODE	OPERAND	TAPE OPERATIONS TEST	CT	ADDRS	INSTRUCTION
	*	*LRCCR TEST				
	*	WRITE AT 200 BPI - 1 2 4 8 A B C				
B	MONITR			7	02898	J 01841
LRCRCK	NOPWN			1	02905	N
BCE	*E8,TAD7,1	BYPASS IF TAD NOT SET		12	02906	B 02925 01007 1
B	NOLRCR	BYPASS LRCR TEST		7	02918	J 03185
CW	LRCRCK61	DONT REPEAT TIL NEXT CHAN		6	02925	D 02906
B	RWD	REWIND		7	02931	J 06875
B	TYPEIT			7	02938	J 09344
DCW	@SET TO 200 BPI@,G	SET DENSITY SWITCH		14	02958	
H				1	02960	*
CS	WKAREA			6	02961	/ 00163
MLCWS	GMMW,WKAREA-62			12	02967	D 01009 00101 7
SW	A1BIT61	SET STARTING ADUR IN INDEX REG		6	02979	P 09344
SAR	SKK4			7	02985	G 00069 A
MLCS	0ESXR4,WKAREA-63	SET UP CHARACTER		12	02992	D 00140 00100 3
SAR	SXR4			7	03004	G 00069 A
B	WTB			7	03011	J 07045
DCW	-WKAREA	DATA TAKEN FROM HERE		5	03022	00163
BW	SETNXT,16SXRx4	WRITE 1 2 4 8 A B C BITS		12	03023	V 02992 00141 1

LABEL OPCODE OPERAND TAPE OPERATIONS TEST

• LRCR TEST ROUTINE
READ AT 556 8PI

LABEL	OPCODE	OPERAND	TAPE OPERATIONS TEST	C/I	ADDRS	INSTRUCTION
	B	RWD	REWIND	7	03035	J 06875
	B	TYPEIT		7	03042	J 09344
DCW		ASET TO 556 8PI&G	SET DENSITY SWITCH	14	03062	
H			SET TADS TO 1 FOR STOP	1	03064	
S	RECNT1			6	03065	S 01153
C ^K ALL7	BCE	NOLRCR,RECNT1,7	ZERO RECORD COUNT	12	03071	B 03185 01153 7
SW		BYPASSE1	ALL DONE	6	03083	* 07651
B	RTB		DO ERROR CHECKING HERE	7	03089	J 07438
A	ONE,RECNT1		ADD TO COUNT	11	03096	A 08681 01153
BER1	* 67		BETTER GET DATA CHK	7	03107	R 03120 4
ERROR	90	SW	ERR90	6	03114	* 00291
	BCE	* E8,BUFFER,*	CHARACTER MUST NOT BE AN *	12	03120	B 03139 09400 *
B	* 67			7	03132	J 03145
ERROR	91	SW	ERR91	6	03139	* 00292
	BEX1	* E8,Z	BRANCH ON A/8/1	7	03145	R 03159 4
B	* 67			7	03152	J 03165
ERROR	92	SW	ERR92	6	03159	* 00293
	SW	CK4LUPP1	DONT LOOP HERE	6	03165	* 01870
B	MONITR			7	03171	J 01841
B	CKALL7			7	03178	J 03071

TAPE OPERATIONS TEST

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
* TEST END OF XFER ON WRITE AND READ					
	*	WRITE 10 CHAR RECORD- READ INTO 10 CHAR AREA			
NOLRCR	B	MONITR	7	03185	J 01841
	CW	TENGMS	6	03192	W 08680
	B	WT	7	03198	J 07027
	DCW	TENGMS	5	03209	08680
C	XAREOT,C09411	COMP ADUR REG TO 09411	11	03210	C 00059 01115
	*E7	S/B EQU TO GMWM & 1	7	03221	J 03234 S
ERROR 27	SW	ERR27	6	03228	* 00228
	B	BSP	7	03234	J 06894
	B	RT	7	03241	J 07420
C	XAREOT,C09411	COMP ADDR REG TO 09411	11	03248	C 00059 01115
	*E7	S/B EQU TO GMWM & 1	7	03259	J 03272 S
ERROR 28	SW	ERK28	6	03266	* 00229
* WRITE 10 CHAR RECORD- READ INTO 9 CHAR AREA					
B	MONITR		7	03272	J 01841
CW	TENGMS	CLEAR WM IN CASE SET	6	03279	W 08680
B	WT		7	03285	J 07027
DCW	TENGMS		5	03296	08680
B	BSP	SET REC LEN FOR 9 CHARS	7	03297	J 06894
MLNA	C00009,RECLEN	DO ERROR CHECKING HERE	12	03304	D 01090 00049 /
SW	BYPASS&1		6	03316	* 07651
B	RT		7	03322	J 07420
C	XAREOT,C09410	COMP ADDR REG TO 09410	11	03329	C 00059 01110
	*E7	S/B EQU TO GMWM & 1	7	03340	J 03353 S
ERROR 29	SW	ERR29	6	03347	* 00230
	BWL1	EXPECT WLR	7	03353	R 03366 -
ERROR 30	SW	ERR30	6	03360	* 00231
	BEX1	*E8,S	7	03366	W R 03380 S
	B	*E7	7	03373	J 03386
ERROR 31	SW	ERR31	6	03380	* 00232

LABEL	OPCODE	OPERAND	TAPE OPERATIONS TEST	CT	ADDR	T020	INSTRUCTION
*			WRITE 9 CHAR RECORD-READ INTO 10 CHAR AREA				

	B	MONITR TENGMS	SET WM TO TEST EOT	7	03386	J 01841
SW		WT		6	03393	* 08680
B		TENGMS		7	03399	J 07027
DCW		XAREDT,C09410	COMP ADDR REG TO 09410 S/B EQU TO GMWM & 1 ?	5	03410	08680
C		*E7		11	03411	C 00059 01110
BE		ERR32		7	03422	J 03435 S
ERROR	32	SW	BSP	6	03429	* 00233
B		SW	BYPASSE1	7	03435	J 06894
RT			RT	6	03442	* 07651
C		XAREDT,C09410	COMP ADDR REG TO 09410 S/B EQU TO GMWM & 1	7	03448	J 07420
BE		*E7		11	03455	C 00059 01110
ERROR	33	SW	BWL1	7	03466	J 03479 S
B		ERR33	WL SHOULD BE SET	6	03473	* 00234
ERROR	34	SW	ERK34	7	03479	R 03492 -
BEX1		*E8,5	CHECK FOR NR & UC	6	03486	* 00235
B		*E7		7	03492	R 03506 S
ERROR	35	SW	ERR35	7	03499	J 03512
CW		TENGMS	BE SURE NO WM	6	03506	* 00236
			*****	6	03512	* 08680

LABEL OPCODE OPERAND

CT ADDRS INSTRUCTION

* TEST NORMAL READ & WRITE AT EOM

8	MONITR		SET ADDR IN X-REG	7	03518	J 01841
MLNA	WTADDR,8BBBBB		CLEAR TOP 10 LOC'S	12	03525	D 01135 00054 /
CS	9E888888		MOVE 10 GMS TO EOM	6	03537	/ 004.9
MLCS	TENGMS,9E888888			12	03543	0 08680 004.9 3
MLCS				1	03555	D
MLCS				1	03556	D
MLCS				1	03557	D
MLCS				1	03558	D
MLCS				1	03559	D
MLCS				1	03560	D
MLCS				1	03561	D
MLCS				1	03562	D
SW	BPRIMRG1		SET SW TO MOD WT ADR	6	03564	* 07345
B	WT		WRITE FROM MOD ADDR	7	03570	J 07027
DCW	DUMMY		DUMMY WRITE FIELD	5	03581	08760
C	XAREOT,EOMAN1		CHK FOR EOM & 1	11	03582	C 00059 01130
BE	*C7			7	03593	J 03606 S
ERROR 36	SW	ERR36		6	03600	* 00237
B	BSP			7	03606	J 06894
CS	9E888888		CLEAR TOP 10 LOC'S	6	03613	/ 004.9
SW	BPRIMRG1		SET SW TO MOD RI ADR	6	03619	* 07562
B	RT		READ INTO MOD ADDR	7	03625	J 07420
C	XAREOT,EOMAN1		CHK FOR EOM & 1	11	03632	C 00059 01130
BE	*C7			7	03643	J 03656 S
ERROR 37	SW	ERR37		6	03650	* 00238

TAPE OPERATIONS TEST

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LABEL OPCODE OPERAND CI ADDRS INSTRUCTION

* TEST WRONG LENGTH SPECIFICALLY

* FORCE WLR BY WRAP A ROUND

6	MONITR		7	03656 J 01841
	MLNA	WTEADR,0BBBB		12 03663 0 01135 00054 /
	CS	9EBBBBBB		6 03675 / 00*.*
	MLCS	TENGMS,9EBBBBBB		12 03681 0 08680 00*.* 3
	MLCS			1 03693 D
	MLCS			1 03694 D
	MLCS			1 03695 D
	MLCS			1 03696 D
	MLCS			1 03697 D
	MLCS			1 03698 D
	MLCS			1 03699 D
	MLCS			1 03700 D
	MLCS			1 03701 D
	SW	BPRIMWEL		6 03702 * 07345
8	WT			7 03708 J 07027
	DCW	DUMMY		5 03719 08760
	B	BSP		7 03720 J 06894
	CS	9EBBBBBB		6 03727 / 00*.*
A	ONE,0BBBBB	FORCE WLR BY RAPARND		11 03733 A 08681 00054
	SW	BPRIMRE1		6 03744 * 07562
	SW	BYPASSE1		6 03750 * 07651
	B	RT		7 03756 J 07420
C	XAREUT,EOMANI	READ INTO MOD ADDR		11 03763 C 00054 01130
	BE	*E7		7 03774 J 03787 S
ERROR	38	SW	ERR38	6 03781 * 00239
		BWL1	*E7	7 03787 R 03800 -
ERROR	39	SW	ERR39	6 03794 * 00240 S
		BEX1	*E8,S	7 03800 R 03814 S
		B	*E7	7 03807 J 03820
ERROR	40	SW	ERR40	6 03814 * 00241

OPCODE OPERAND

CT ADDRS INSTRUCTION

* FORCE WLR BY FALLING 1 CHAR SHORT

B	MONITR								
MLNA	WTEADR,BBBBBB	SET ADDR IN X-REG							
CS	9EBBBBBB	CLEAR TOP 10 LOCS							
MLCS	TENGMS,9EBBBBBB	MOVE 10 GMS TO EOM							
MLCS									
MLCS									
MLCS									
MLCS									
MLCS									
MLCS									
MLCS									
MLCS									
SW	BPRIMM61	WRITE FROM MOD ADDR							
B	WT	DUMMY WRITE FIELD							
DCW	DUMMY								
B	BSP								
CS	9EBBBBBB	CLEAR TOP 10 LOCS							
S	ONE,BBBBBB	FORCE WLR ON 1 SHORT							
SW	BPRIMM61								
SW	BYPASS61	CHECKING DONE HERE							
B	RT	READ INTO MOD ADDR							
C	XAREOT,EDMAN1	CHK FOR EOM & 1							
BE	*E7								
ERROR 41	SW	ERR41							
	DWLI	*E7							
ERROR 42	SW	ERR42							
	BEX1	*E8,S	ANY OTHER IND SET						
	B	*E7							
ERROR 43	SW	ERR43							

TAPE OPERATIONS TEST

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CT ADDRS INSTRUCTION

LABEL

OPCODE

OPERAND

* TEST WRITE TO-READ TO END OF MEMORY

B	MONITR								
MLNA	WTADDR,0BBBBB	SET ADDR IN X-REG							
CS	9EBBBBBB	CLEAR TOP 10 LOC'S							
MLCS	TENGMMS,9EBBBBBB	MUVE 10 GMS TO EOM							
MLCS									
MLCS									
MLCS									
MLCS									
MLCS									
MLCS									
MLCS									
MLCS									
MLCS									
SW	4EBBBBBB	SET WM TO TEST EDI							
SW	BPRIMR61								
B	WTBEM	WRITE TO EOM FROM MODIFIED ADDR							
DCW	DUMMY	DUMMY WRITE FIELD							
C	XAREOT,EOMANI	CHK FOR EOM & 1							
BE	*67								
ERROR 45	SW	ERR45							
B	BSP								
CS	9EBBBBBB	CLEAR TOP 10 LOC'S							
MLCS	GMMMS,5CBBBBBB	SET GM WM,TEST XFER							
SW	BPRIMR61								
B	RTBGM	READ TO EOM INIT MOD ADUR							
C	XAREOT,EOMANI	CHK FOR EOM & 1							
BE	*67								
ERROR 46	SW	ERR46							

LABEL	OPCODE	OPERAND	CT	ADDR	INSTRUCTION
*		*TEST ADDRESS REGISTER AT END OF TRANSFER			
*		WRITE 64 CHARACTER RECORD			
*		READ BACK WITH READ TO END OF MEMORY			

LABEL	OPCODE	OPERAND	CT	ADDR	INSTRUCTION
	B	MONITR	7	04140	J 01841
	B	WTB	7	04147	J 07045
	DCW	-ALTBIT	5	04158	08688
	B	BSP	7	04159	J 06894
	MLNA	C00986,RECLEN	12	04166	D 01105 00049 /
	SW	BYPASSE1	6	04178	* 07651
	B	RTBGM	7	04184	J 07492
	C	XAREOT,C09465	11	04191	C 00059 01120
	HE	* E7	7	04202	J 04215 S
	ERROR	47 SW	ERR47	6	04209 * 00248
		BWL1	* E7	7	04215 R 04228 -
	ERROR	48 SW	ERR48	6	04222 * 00249 S
		BEXL	* E8, H	7	04228 R 04242 H
	B	* E7	7	04235	J 04248
	ERROR	49 SW	ERR49	6	04242 * 00250

	GO210K	NOPWM	1	04248	N
	B	ODEVN1	7	04249	J 10000

TAPE OPERATIONS TEST
OPCODE OPERAND

* FIRST TEST OF WRITE-READ DATA LINES
* CHECK DATA LINES USED IN TM

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
NEXTTR	B	MONITR	7	04256	J 01841
	B	WT	7	04263	J 07027
	DCW	TEN1S	5	04274	08690
	B	WT	7	04275	J 07027
	DCW	TEN2S	5	04286	08700
	B	BSP	7	04287	J 06894
	B	BSP	7	04294	J 06894
	B	RT	7	04301	J 07420
	C	BUFER69,TEN1S	11	04308	C 09409 08690
	BE	*E7	7	04319	J 04332 S
	ERR50	RT	6	04326	* 00251
		READ TEN 2S	7	04332	J 07420
	C	BUFER69,TEN2S	11	04339	C 09409 08700
	BE	*E7	7	04350	J 04363 S
	ERROR 51	SW	6	04357	* 00252
		ERR51			
	B	MONITR	7	04363	J 01841
	B	WT	7	04370	J 07027
	DCW	TEN4S	5	04381	08710
	B	WT	7	04382	J 07027
	DCW	TEN8S	5	04393	08720
	B	BSP	7	04394	J 06894
	B	BSP	7	04401	J 06894
	B	RT	7	04408	J 07420
	C	BUFER69,TEN4S	11	04415	C 09409 08710
	BE	*E7	7	04426	J 04439 S
	ERR52	SW	6	04433	* 00253
		READ TEN 4S			
	B	RT	7	04439	J 07420
	C	BUFER69,TEN8S	11	04446	C 09409 08720
	BE	*E7	7	04457	J 04470 S
	ERROR 53	SW	6	04464	* 00254
		*			

TAPE OPERATIONS TEST

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CT ADDRS INSTRUCTION

OPCODE OPERAND

T020

CT ADDRS INSTRUCTION

* * WRITE & READ THE COLLATING SEQUENCE
 MOVE & LOAD MODE, EVEN & ODD PARITY

B	MONITR	M XUN BUFFER W	7 04470 J 01841
B	WT	COLLATING SEQUENCE	7 04477 J 07027
DCW	-COLSEQ	M XBN BUFFER W	5 04488 08824
B	WTB	-COLSEQ	7 04489 J 07045
DCW		BSP OVER BOTH RECS	5 04500 08824
B	BSP	M XUN BUFFER R	7 04501 J 06894
B	BSP	COMPARE DATA	7 04508 J 06894
B	RT	SHOULD NOT BE EQUAL	7 04515 J 07420
C	BUFER&63,COLSEQ	MLCS COLSEQ-44,BUFER&19 RESTORE S/B CHAR	11 04522 C 09463 08824
BU	*&7	BUFER&63,COLSEQ	11 04533 J 04546 /
BE	ERR55	COMPARE DATA	6 04540 * 00256
BE	ERR55	MLCS COLSEQ-44,BUFER&19 RESTORE S/B CHAR	12 04546 D 08780 09419 3
C	BUFER&63,COLSEQ	COMPARE DATA	11 04558 C 09463 08824
BE	*&7	*&7	7 04569 J 04582 S
ERROR	56 SW	ERR56	6 04576 * 00257
B	RTB	M XBN BUFFER R	7 04582 J 07438
C	BUFER&63,COLSEQ	BUFER&63,COLSEQ	11 04589 C 09463 08824
BE	*&7	*&7	7 04600 J 04613 S
ERROR	57 SW	ERR57	6 04607 * 00258
B	MONITR	L XBN BUFFER W	7 04613 J 01841
B	WTBW	-COLSEQ	7 04620 J 07081
DCW		BSP	5 04631 08824
B	BSP	RTBW	7 04632 J 06894
B	RTBW	BUFER&63,COLSEQ	7 04639 J 07474
C	BUFER&63,COLSEQ	NO WMS HERE	11 04646 C 09463 08824
BE	*&7	*&7	7 04657 J 04670 S
ERROR	58 SW	ERR58	6 04664 , 00259

TAPE OPERATIONS TEST

LABEL	OPCODE	OPERAND	T020	PAGE 41
		*		

* WRITE MOVE READ LOAD-CHECK FOR WS-WM

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
B	MONITR		7	04670	J 01841
B	WTB		7	04677	J 07045
DCW	-COLSEQ		5	04688	08824
B	BSP		7	04689	J 06894
SW	BYPASSE1		6	04696	* 07651
B	RTBW		7	04702	J 07474
BWL1	* E7		7	04709	R 04722 -
ERROR 59	SW	ERR59	12	04722	B 04740 09463
BCE	SW	* E7,BUFER&63,	6	04716	* 00260
ERROR 60	SW	ERR60	6	04734	* 00261
SW	COLSEQ-46	SET WM FOR COMPARE	6	04740	* 08778
C	BUFER&62,COLSEQ	COMPARE DATA	11	04746	C 09462 08824
BE	* E7		7	04757	J 04770 S
ERROR 61	SW	ERR61	6	04764	* 00262
CW	COLSEQ-46	RESTORE TO ORIG COND	6	04770	□ 08778
C	BUFER&15,COLSEQ-48	COMPARE DATA	11	04776	C 09415 08776
BE	* E7		7	04787	J 04800 S
ERROR 62	SW	ERR62	6	04794	* 00263

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
*		SET WMS OVER COLLATING SEQUENCE			
*		WRITE MOVE-READ LOAD,-TEST FOR WMS			
*		WRITE LOAD-READ LOAD,-TEST FUR WMS			
6	MONITR	CLEAR OUT WORK AREA	7	04800	J 01841
	CS WKAREA	MOVE COL SEQ TO MOD	6	04807	/ 00163
	MLCA COLSEQ,WKAREA	SET WMS	12	04813	D 08824 00163 1
	WKAREA-15,WKAREA-31	IN RECORD	11	04825	* 00148 00132
	WKAREA-46,WKAREA-47		11	04836	* 00117 00116
6	WTB		7	04847	J 07045
	DCW -WKAREA	COL SEQ WITH WMS	5	04858	00163
B	WTBW		7	04859	J 07081
	DCW -WKAREA		5	04870	00163
B	BSP		7	04871	J 06894
B	BSP		7	04878	J 06894
B	RTB	NO WMS HERE	7	04885	J 07438
C	BUFER&63,COLSEQ		11	04892	C 09463 08824
	* 67		7	04903	J 04916 S
BE	ERR63		6	04910	* 00264
ERROR 63	SW		7	04916	J 07474
	B RTBW	CHECK FOR WM	12	04923	V 04941 09417 1
BW	* 67,BUFER&17				
ERROR 64	SW	ERR64	6	04935	* 00265
BW	* 67,BUFER&32	CHECK FOR WM	12	04941	V 04959 09432 1
ERROR 65	SW	ERR65	6	04953	* 00266
BW	* 67,BUFER&48	CHECK FOR WM	12	04959	V 04977 09448 1
ERROR 66	SW	ERR66	6	04971	* 00267
CW	BUFER&17	CLEAR WM	6	04977	■ 09417
CW	BUFER&32,BUFER&48	CLEAR WMS	11	04983	□ 09432 09448
C	BUFER&63,COLSEQ	COMPARE DATA	11	04994	C 09463 08824
BE	* 67		7	05005	J 05018 S
ERROR 67	SW	ERR67	6	05012	* 00268

TAPE OPERATIONS TEST

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
*			1020		

* CHECK OPERATION OF 1 ST CHAR. LATCH
 READ RECORD 1 ST CHAR TAPE MARK

B	MONITR	M XUN BUFER W	7	05018	J 01841
B	WT	A TM, THEN 9 TS	7	05025	J 07027
DCW	CHK1TM		5	05036	08730
B	BSP	DO ERROR CHECKING HERE	7	05037	J 06894
SW	BYPASSE1	M XUN BUFER R	6	05044	* 07651
B	RT	SHOULD GET EOF IND	7	05050	J 07420
BEF1	* E7		7	05057	R 05070 S
ERROR	70 SW	ERR70	6	05064	* 00271
B	BEX1	* E8,M	7	05070	R 05084 M
B	* E7	CHECK FOR DC AND WLR	7	05077	J 05090
ERROR	71 SW	ERR71	6	05084	* 00272
ERROR	71 C	BUFER69,CHR1TM	11	05090	C 09409 08730
BE	* E7	ALL CHARS S/H XFERRD	7	05101	J 05114 S
ERROR	72 SW	ERR72	6	05108	* 00273

* READ RECORD 1ST CHAR 7,REST TMS

B	MONITR		7	05114	J 01841
B	WT	A 7 AND 9 TMS	7	05121	J 07027
DCW	SQRUTS		5	05132	08740
B	BSP	DO ERROR CHECKING HERE	7	05133	J 06894
SW	BYPASSE1		6	05140	* 07651
B	RT	SHOULD NOT GET EOF	7	05146	J 07420
BEF1	* E8		7	05153	R 05167 S
B	* E7		7	05160	J 05173
ERROR	73 SW	ERR73	6	05167	* 00274
B	BEX1	* E8,M	7	05173	R 05187 M
ERROR	74 SW	ERR74	6	05187	* 00275
C	BUFER69,SQRUTS		11	05193	C 09409 08740
BE	* E7		7	05204	J 05217 S
ERROR	75 SW	ERR75	6	05211	* 00276

LABEL OPCOD OPERAND

* TEST FOR ERASE FORWARD DURING
* BACKSPACE AFTER WRITE STATUS

	CT	ADDRS	INSTRUCTION
B	MONITR	7	05217 J 01841
B	WT	7	05224 J 07027
DCW	TEN1S	5	05235 08690
C	WTBEW	DO A WRITE TO EOM	7 05236 J 07099
DCW	ECOLSEQ	COLLATING SEQUENCE	5 05247 08824
B	BSP	BSP OVER BOTH RECS	7 05248 J 06894
B	BSP		7 05255 J 06894
B	WT		7 05262 J 07027
DCW	TEN2S		5 05273 08700
B	BSP		7 05274 J 06894
B	RT		7 05281 J 07420
C	BUFER&9.TEN2S	CHECK RECORD	11 05288 C 09409 08700
BE	*C7		7 05299 J 05312 S
ERROR 76 SW	ERK76	SET REC LEN FOR 586 CHARS	6 05306 * 00277
MLNA	C00586.RECLEN	DO ERROR CHECKING HERE	12 05312 D 01105 00049 /
SW	BYPASSEI		6 05324 * 07651
B	RT6		7 05330 J 07438
C	BUFER&9.LABEL	CHK ON 1ST 10 CHARS	11 05337 C 09409 09399
BU	*E7	SHOULD NOT BE EQUAL	7 05348 J 05361 /
ERROR 77 SW	ERR77	*****	6 05355 * 00278
*	WT-WTB-BSP-BSP	RE WT-BSP-RT-RIB	
*	OK 1 ST PORTION OF 2 ND RECORD GONE		

TAPE OPERATIONS TEST

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* TEST FOR B-REG BIT PICK UP
 * AND A-REGISTER DROP OUT
 * WRITE ODD-READ EVEN- TEST FOR *S

LABEL	OPCODE	OPERAND	CY	ADDR	INSTRUCTION
	B	MONITR	7	05361	J 01841
	B	RWD	7	05368	J 06875
	S	RECNO	6	05375	S 09393
WTBPUR	A	ONE,RECNO	11	05381	A 08681 09393
	B	WTB	7	05392	J 07045
	DCW	CALBIT	5	05403	08688
	BCE	WTBPUR,RECNO-3,0	12	05404	B 05381 09390 0
	B	RWD	7	05416	J 06875
	S	BPUCNT	6	05423	S 01172
	CS	WKAREA	6	05429	/ 00163
	SH	WKAREA-63	6	05435	*
	MLCS	CHCNE7,WKAREA	12	05441	D 01515 00163 3
	MLCB	WKAREA,WKAREA-1	12	05453	D 00163 00162 L
	CH	PICKDCL	6	05465	■ 08670
	SAR	SXR3	7	05471	G 00064 A
ZEROUT	S	0ESXR3	6	05478	S 00.00
	SAR	SXR3	7	05484	G 00064 A
	S	TWO,SXR3	11	05491	S 08691 00064
	BW	ZEROIT,1ESXR3	12	05502	V 05478 00.01 1
	S	RECNT1	6	05514	S 01153
ROBPUR	BCE	REPORT,RECNT1-3,1	12	05520	B 06126 01150 1
	SW	BYPASSE1	6	05532	• 07651
	B	RT	7	05538	J 07420
	A	ONE,RECNT1	11	05545	A 08681 01153
	BEX1	*68,1	7	05556	R 05570 1
	B	CK4AST	7	05563	J 05596
ERROR	80	SW	6	05570	• 00281
	SW	CK4LUPE1	6	05576	• 01870
	B	MONITR	7	05582	J 01841
	B	RDHPUR	7	05589	J 05520
		SKIP CHKS IF IND SET			

TAPE OPERATIONS TEST

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LABEL OPCODE OPERAND

CT ADDRS INSTRUCTION

* CHECK BUFFER SECTION BY SECTION

CK4AST	SW	BUFER1,BUFER9	START & STOP WM MOVE
	MLWB	BUFER9,BUFER8	MOVE WM THRU BUFER
	SW	BUFRNDE1	SET UPPER LIMIT
	SAR	SXR3	IN INDEX REGISTER
	C	SXR3,C09410	CHK FOR END OF FIELD
CK4MOR	BH	ROBPUR	READ NEXT RECORD
	C	0ESXR3,WKAREA	FIELDS OF * S
	SAR	SXR3	SAVE ADDRESS
	BE	CK4MOR	CHECK FOR END OF REC

* FIND CHARACTERS INVOLVED

MLNB	SXR3,HOLDIT	SAVE ADDRESS	
SW	ALTBIT61	SET ADDR OF PATTERN	
SAR	SXR4	IN INDEX REGISTER	
A	C00064,SXR3	ADD TO ADDRESS	
NDOSEC	C	SXR3,HOLDIT	CHK FOR END OF SECT
	BE	CK4MOR	RESUME CHK BY SECT
SCNFLD	SCNL\$	0ESXR3,0ESXR4	SCAN FIELDS
	SAR	SXR3	CHAR IN BUFFER
	SBR	SXR4	CHAR IN ALTBIT PATRN
BCE		NDUSEC,1&SXR3,*	CONTINUE CHK IF *
A	ONE,BPUCNT	COUNT EACH ERROR	
BCE	TOMANY,BPUCNT-4,1	MORE THAN 9999	

TAPE OPERATIONS TEST

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LABEL OPCODE OPERAND

* ANALYZE BITS PICKED UP OR DROPPED

	CT	ADDR	INSTRUCTION
CW	HAFWAYC1,PICKUPC1	SET SWITCHES	11 05790 B 05883 05955
S	ERRCNT	ZERO COUNTER	6 05801 S 08670
SW	PICKDBE1	SET ADDR FOR START	6 05807 * 08664
SAR	SXRA	OF TALLEY TABLE	7 05813 G 00074 A
SW	1ESXR4	NEED IT FOR LOOK UP	6 05820 * 00.*1
LE	1ESXR4,BITABL	FIND CHAR WRITTEN	12 05826 T 00.*1 06106 2
SBR	SXR8		7 05838 G 00079 B
CW	1ESXR4		6 05845 H 00.*1
MLCS	0ESXR8,BITCHKCL1	MOVE BIT FOR TESTING	12 05851 D 00.*Q 05881 3
SAR	SXR8		7 05863 G 00079 A
BBE	PICKUP,1ESXR3,	TEST BITS IN CHAR RD	12 05870 W 05954 00.01
BITCHK	NOPWM		1 05882 N
HAFWAY	BBE	ADDONE,1ESXR8,M	12 05883 W 05962 00.Q 1
CHK4WM	BW	CHKONC,0ESXR8,	12 05895 V 05991 00.MU 1
S	BITCHK,SXRA	SUB 6,STEP TO NEXT TALLEY	11 05907 S 05870 00074
C	SXRA,HAFDUN	1/2 WAY THRU TABLE	11 05918 C 00014 01167
BU	MOVBIT	CONT PICKUP TEST	7 05929 J 05851 /
SW	HAFWAYC1,PICKUPC1	SET FOR DROPOUT TEST	11 05936 * 05883 05955
B	CHK4WM		7 05947 J 05895
PICKUP	NOPWM		1 05954 N
	B	CHK4WM	7 05955 J 05895
ADDONE	A	DNE,0ESXRA	11 05962 A 08681 00..U
	A	DNE,ERRCNT	11 05973 A 08681 08670
	B	CHK4WM	7 05984 J 05895

TAPE OPERATIONS TEST

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
CHKONC	BEE	NDSEC,ERRCNT,1	12	05991	W 05711 08670 1
	BCE	LOSTAC,0ESXRBC,C	12	06003	B 06033 00.MO C
	A	ONE,PICKDC	11	06015	A 08681 08669
LOSTAC	B	NOSEC	7	06026	J 05711
	A	ONE,DROPDC	11	06033	A 08681 08627
	B	NDSEC	7	06044	J 05711
	DCW	AC 4 S 12 8 -UA	14	06064	
		a 2 8 -1 4 S .a	14	06078	
		a 1 4 S 2 8 -Va	14	06092	
BITABL	DCW	AC12 8 - 4 B \$a	14	06106	
TOMANY	SW	ERK81	6	06107	* 00282
	SW	CK4LUPC1	6	06113	* 01870
	B	MONITR	7	06119	J 01841
	REPORT		6	06126	* 08670
	SW	PICKDCT1	7	06132	G 00064 A
	SAR	SXR3	12	06139	D 00.00 06190 L
NXTOTL	MLCB	0ESXR3,BITALY			
	SAR	SXR3	7	06151	G 00064 A
	C	BITALY,COUNT0	11	06158	C 06190 08754
	B	DONTYP	7	06169	J 06192 S
	B	TYPEIT	7	06176	J 09146
	DCW	a * a	2	06184	
BITALY	DCW	a .G	6	06190	
DONTYP	BW	NXTOTL,1ESXR3	12	06192	V 06139 00.01 1
		*****	*		

TAPE OPERATIONS TEST

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CT ADDRS INSTRUCTION

LABEL OPCODE OPERAND

- * WRITE & READ 1000 RECORDS
- * ALTERNATE BIT PATTERNS
- * RIPPLE WRITE TRIGGER FREQUENCY TEST

	B	MONITR	REWIND	7	06204	J 01841
	B	RWD	ZERO RECORD COUNT	7	06211	J 06875
	S	RECNO	SET CNT IN REC LABEL	6	06218	S 09393
NXTREC	A	ONE,RECNO	M XBN BUFER W	11	06224	A 08681 09393
	B	WTB	ALT BIT PATTERN	7	06235	J 07045
	DCW	EALTBIT	100 RECORDS	5	06246	08888
	BCE	NXTREC,RECNO-2,0	TO SKIP/ERASE ROUTINE	12	06247	B 06224 09391 0
	B	SKP		7	06259	J 06932
RECYCL	SW	FREQ1	SET START ADDR IN AR	6	06266	* 01230
	SAR	SXR4	TO MOD MOVE ADDR	7	06272	G 00069 A
WTMORE	MLCB	0ESXR4,TSTPAT	SAVE STOP ADDR	12	06279	D 00*40 06320 L
	SAR	SXR4		7	06291	G 00069 A
	A	ONE,RECNO		11	06298	A 08681 09393
	B	WTB		7	06309	J 07045
TSTPAT	DCW	EWTFPL	WRITE TRIGGER FREQ	5	06320	08952
	BW	WTMORE,1ESXR4	CONT TO NEXT PATRN	12	06321	V 06279 00*41 1
	BCE	RECYCL,RECNO-3,0	1000 RECORDS	12	06333	B 06266 09390 0
A	RWD	REWIND		7	06345	J 06875
	S	RECNT1	ZERO RECORD COUNT	6	06352	S 01153
	BCE	RDDONE,RECNT1-3,1	1000 RECORDS	12	06358	B 06554 01150 1
MLNB	BUFER&3,SAVEIT	SAVE RECORD NUMBER		12	06370	D 09403 01176 J
	H	RTH	M XBN HTR R	7	06392	J 07434
	A	ONL,RECNT1	COUNT RETURS	11	06399	A 09681 01153
	C	BUFER&3,RECNT1	CHK ON REC NUMBER	11	06400	C 09403 01153
BE	RDMORE	READ THE NEXT REC		7	06411	J 06358 S
	C	BUFER&3,SAVEIT	SAME RECNO AS LAST 1	11	06418	C 09403 01176
	BU	CKAHED	CHECK FOR HIGHER NO	7	06429	J 06462 /
ERROR	82	SW	ERR82	6	06436	* 00283
	SW	CK4LUP&1	DO NOT LUOP HERE	6	06442	* 01870
	B	MONITR		7	06448	J 01841

TAPE OPERATIONS TEST

LABEL	OPCOD	OPERAND	INSTRUCTION	C	T	ADDR	CT	INSTRUCTION
	B	RDMORE	CONTINUE READING	7	06455	J 06358		
CKAHED	S	RECNT2	ZERO COUNTER	6	06462	S 01157		
UPONE	A	ONE,RECNT1	UP COUNT BY ONE	11	06468	A 08681 01153		
	A	ONE,RECNT2	LOOK FOR LABEL	11	06479	A 08681 01157		
	C	BUFER&3,RECNT1	CHK ON REC NUMBER	11	06490	C 09403 01153		
OUTSEQ		OUTSEQ	OUT OF SEQUENCE	7	06501	J 06522 S		
NOHERE	BZ	NOHERE	BEEN THRU ALL 1000	7	06508	J 06548 V		
	B	UPONE	TRY AGAIN	7	06515	J 06468		
OUTSEQ	SW	ERR83	DU NOT LOOP HERE	6	06522	* 00284		
	SW	CK4LUPP1		6	06528	* 01870		
	B	MONITR		7	06534	J 01841		
	B	RDMORE	READ AGAIN	7	06541	J 06358		
NOHERE	SW	ERR84		6	06548	* 00285		
RDNONE	B	MONITR	*****	7	06554	J 01841		
	*							

CT ADDRS INSTRUCTION

TAPE OPERATIONS TEST

OPCODE OPERAND

- * END OF PROGRAM PASS ON ONE DRIVE
- * GO TO CHECK FOR NEXT DRIVE ON CHAN

B	TYPEIT	PASS COMPLETE 1 TD	7	06561 J 09344
DCW	@PAssA,G	PASS COMPLETE 1 TD	4	06571
MLNS	UNITNO,RDYTDSETDIND MOVE TD NO TO TABLE	12	06573 D 01737 00M/0 1	
A	ONE,TDIND	ADD 1 TO 1@ LOC CTR	11	06585 A 08681 00089
B	NEXTDR	TRY NEXT DRIVE	7	06596 J 01696
		ONE COMPLETE PASS	7	06603 J 09344
CK4EOJ	B	-ALL RDY TDS, ALL CHS	3	06612
DCW	@EOJa,G	SET RESTART ADDRESS	6	06614 □ 02001
CW	STARTC1	IN INDEX REGISTER	7	06620 G 00034 A
SAR	SXR2	REPEAT,TAD3,1	12	06627 B 02008 01003 1
BCE	REPEAT,TAD3,1	REPEAT WHOLE TEST	7	06639 J 00400
B	LOADER	GO GET NEXT PROGRAM		*****

- *REWIND ALL DRIVES USED ON A CHANNEL

FSTRWD	CW	FSTRWDE8	SET ADDRESS	6	06646 □ 06654
	SAR	SXR2	IN MONITR XR	7	06652 G 00034 A
S	TDIND	ZERO ID IND COUNTER	6	06659 S 00089	
NEXTD	MLNS	RDYTDSETDIND,RWDTDSE3	SELECT NEXT DRIVE	12	06665 D 00M/0 06769 1
BCE	CKCHNS,RDYTDSETDIND,0	LAST TD ON CHAN	12	06677 B 0153, 00M/0 0	
A	ONE,TDIND	ADD TO COUNT	11	06689 A 08681 00089	
MLCS	COLSEQ-15,RWDTDSE4	REWIND AND UNLOAD	12	06700 D 08809 06770 3	
BCE	*E13,TAD6,1	SET FOR REWIND AND UNLOAD	12	06712 B 06736 01006 1	
MLCS	COLSEQ-19,RWDTDSE4	REWINDS ONLY	12	06724 D 08805 06770 3	
SW	RWDSDWCL	RETURN TO FAST RWD	6	06736 * 08314	
MLCB	WHAT,WHAT-1	BLANK FOR U.C. OP	12	06742 D 08242 08241 L	
MLCA	RWDTDSE4,WHAT-6	SET INST IN MSGE	12	06754 D 06770 08236 T	
RWDOTS	RWD 10	REWIND ALL DRIVES TESTED	5	06766 U XUO R	
	BNR1	TSTIND	7	06771 R 07931 C	
B	*-18	LOOK FOR NOT READY	7	06778 R 06766 H	
	NEXTD	GO GET NEXT ONE	7	06785 J 06665	

TAPE OPERATIONS TEST

OPCODE OPERAND

*SPACE, DELAY AND TEST FOR I:I: ON

SPACE	SBR	RETURN						
	CU	*U1,A *E8,B	SPACE OVER T.M. BRANCH ON 1/4/8/A/B					
	BEX1	*--18	TRY AGAIN IF BUSY					
	BA1		SET SWITCHS TO					
	SW	T1SW	EXPECT TI ON					
	CW		ZERO 6 POS FIELD					
	S	D1ACNT	ADD LOOP TIME TO CNT					
	A	TIME1,D1ACNT	TI ON -OK, LEAVE					
	BT1	*E20	ALLOW UP TO 1 SECOND					
	BCE	--29,D1ACNT-5,0	NO TI ON, LEAVE					
	CW	T1SW						
	SW		RETURN TO MAIN LINE					
	B	QRETURN	*****					

TAPE OPERATIONS TEST

LABEL	OPCOD	OPERAND	CT	AUDRS	INSTRUCTION
RWD	SBR	RETURN	7	06875	G 00039 B
	B	UCONRT	7	06882	J 06951
	DCW	auxuira	5	06893	
BSP	SBR	RETURN	7	06894	G 00039 B
	B	UCONRT	7	06901	J 06951
	DCW	auxuiba	5	06912	
WTM	SBR	RETURN	7	06913	G 00039 B
	B	UCONRT	7	06920	J 06951
	DCW	auxuima	5	06931	
SKP	SBR	RETURN	7	06932	G 00039 B
	B	UCCNRT	7	06939	J 06951
	DCW	auxuiae	5	06950	
		UNIT CONTROL ROUTINE			
UCONRT	SBR	SXR3	7	06951	G 00064 B
	MLCWB	46SXR3,UCONOP&4	12	06958	D 00.04 06974 P
UCONOP	BSP	11	5	06970	U ZUI 8
	MLC8	WHAT,WHAT-1			
	MLCA	UCONOP&4,WHAT-6			
	B	TST4OL			
	BEX1	*E8,B			
	BA1	UCONOP			
	B	MERGE			
		STORE OP REQUESTED			
		SET OP REQ IN PLACE			
		U.C. INST- VARIABLE			
		BLANK FIELD			
		SET INST IN ERR MSG			
		GO SEE ABOUT OVERLAP			
		BRANCH ON 1/4/8/A/B			
		TRY AGAIN IF BUSY			
		CONT IN COMMON RT			

LABEL	OPCODE	OPERAND	C1	ADDR	INSTRUCTION
*		ALTER WRITE INSTRUCTION IN UTILITY			
*		WRITE ROUTINE TO INSTRUCTION REQUESTED			
WT	SBR	DATA B SETOP DCW @M%UI@	LOC OF WRITE FIELD RT TO SET UP OP REQ	7 7 7 4	07027 G 00044 B 07034 J 07142 07044
WTB	SBR	DATA B SETOP DCW @M%B1@		7 7 4	07045 G 00044 B 07052 J 07142 07062
WTW	SBR	DATA B SETOP DCW @LXUI@	LOC OF WRITE FIELD	7 7 4	07063 G 00044 B 07070 J 07142 07080
WTBW	SBR	DATA B SETOP DCW @LXB1@		7 7 4	07081 G 00044 B 07088 J 07142 07098
WTBEW	SBR	DATA	7	07099	G 00044 B
	MLCS	COLSEQ-12,WRITER9	12	07106	0 08812 07372 3
WTEOSW	NOP		1	07118	N
	MLCS	CHCON-4&CHSTCT,WTEOP-2 SET FOR UN-QL	12	07119	0 01E4 07139 3
WTEOP	B DCW	SETOP @LXB1@	7 4	07131 07141	J 07142 A
SETOP	SBR	SXR3 3GSXR3,WRITER3 6DATA SAR	STORE ADDR OF OP REQ SET OP REQ IN PLACE ESTABLISH RETURN ADD STORE IN COMMON EXIT	7 12 6 7	07142 G 00064 B 07149 0 00.03 07366 I 07161 0 00*06 07167 G 00039 A

LABEL	OPCODE	OPERAND	TAPE OPERATIONS TEST	CT	ADDRS	PAGE	1020	PAGE	55
* * * * *									
CHECK FOR LABEL. FILL BUFFER COMPLETELY									
S	RECLLEN	ZERO RECLLEN COUNT	6	07174	S 00049				
MLNA	C00010,RECLLEN	SET REC LEN FOR 10 CHARS	12	07180	D 01095 00049 /				
BZN	SETEND,4&DATA,	NO ZONE,10 CHAR REC	12	07192	V 07240 00104 ?				
MLNA	C00064,RECLLEN	RECORD LENGTH 64 CHS	12	07204	D 01100 00049 /				
BZN	SETEND,4&DATA,B	ZONE = 64 CHAR ONLY	12	07216	V 07240 00104 K				
MLNA	C00586,RECLLEN	SET REC LEN FOR 586 CHARS	12	07228	D 01105 00049 /				
SETEND	B CLEAR	CLEAR BUFFER-SET GMHM AT END	7	07240	J 07825				
SW	BUFER,BUFER9	SET WMS FOR MUVT	11	07247	* 09400 09922				
MLNA	4&DATA,*E6	PUT ADDR OF DATA IN	12	07258	D 00104 07275 /				
MLCWB	00000,BUFER-1&RECLLEN	SET DATA IN BUFFER	12	07270	D 00000 09179 P				
BZN	ALABEL,4&DATA,E	DATA LOC E,USE LABEL	12	07282	V 07307 00104 b				
CW	BUFER	NO WM IN 1ST LOC	6	07294	H 09400				
B	BPRIMW	TO WRITE ROUTINE	7	07300	J 07344				
MLCWB	BUFER-1&RECLLEN,BUFER9-1	FILL UP BUFFER	12	07307	D 09179 09921 P				
C	MLNA RECLLEN,LENGTH	SET RECORD LEN IN LABEL	12	07319	D 00049 09398 /				
MLCA	LABEL,BUFER9	MOVE LABEL TO BUFFER	12	07331	D 09399 09409 I				
C	NOP		1	07343	N				
* * * * *									
* * * * *									
ALABEL		WRITE ROUTINE							
MLCA	NOPWM								
CW	BPRIME,WRITE9	SET NEW WRITE ADDR	1	07344	N				
WT	BPRIMW1	CLEAR SW	12	07345	D 01125 07371 I				
SBR	11,BUFFER	M/L XXN BUFFER W, U/B	6	07357	H 07345				
MLCA	XAREOT	B-REG, END OF X-FER	10	07363	M ZUL 09400 W				
B	WRITE9,WHAT-1	MOVE INST TO ERR MSG	7	07373	G 00051 H				
0EX1	TSI40L	CD SEE ABOUT OLAP	12	07380	D 07372 08241 I				
BAL	*68,B	BRANCH ON 1/4/8/A/B	7	07399	R 07413 L				
B	WRITE	TRY AGAIN IF BUSY	7	07406	R 07363 G				
	MERGE	CONT IN COMMON RT	7	07413	J 07630				

LABEL	OPCODE	OPERAND	C1	ADDR	INSTRUCTION
* ALTER READ INSTRUCTION IN UTILITY READ ROUTINE TO INSTRUCTION REQUESTED					
RT	SBR	RETURN B READER DCW aM%U1@	COMMON EXIT TO READ ROUTINE	7 7 4	07420 G 00039 B 07427 J 07535 07437
RTB	SBR	RETURN B READER DCW aL%B1@		7	07438 G 00039 B
RTW	SBR	RETURN B READER DCW aL%U1@		7 7 4	07456 G 00039 B 07463 J 07535 07473
RTBW	SBR	RETURN B READER DCW aL%B1@		7 7 4	07474 G 00039 B 07481 J 07535 07491
RTBGH	SBR	RETURN MLCS COLSEQ-\$6,READ69	SET D-MOD TO \$ OVERLAP ON T010 ONLY	7 12	07492 G 00039 B 07499 D 08768 07589 3
RTGOSW	NOP			1	07511 N
	MLCS	CHCON-4ECHSTCT,RTEOP-2	UN-OL READ EOM INSTRUCTION REQUEST	12	07512 D 01E4 07532 3
RTEOP	B READER DCW aL%B1@			7 7 4	07524 J 07535 07534
* READ ROUTINE					
READER	SBR	SXR3 MLCA 3ESXR3,READ63 B NOPWM	STORE ADDR OF OP SET OP REQ IN PLACE CLEAR CLEAR BUFFER-SET GMWM AT END	7 12 7 1	07535 G 00064 B 07542 D 00.03 07583 I 07554 J 07825 07561 N
BPRIMR	MLCA	BPRIME,READ68 CW BPRIMR1	SET NEW READ ADDR CLEAR SW	12 6	07562 D 01125 07588 I 07574 D 07562

O5Q

TAPE OPERATIONS TEST

LABEL	OPCOD	OPERAND					
			CT	ADDRS	INSTRUCTION	CT	ADDRS
READ	RT	11,BUFER	M/L XXN BUFFER R U/B			10	07580 M XUI 09400 R
	SBR	XAREOT	B-REG, END OF X-FER			7	07590 G 00059 B
MLCA	READ9,WHAT-1		SET INST IN ERR MSGE			12	07597 U 07589 08241 R
B	TST4OL		GO SEE ABOUT OVERLAP			7	07609 J 07862 L
BEX1	*68,B		BRANCH ON 1/4/8/A/B			7	07616 R 07630 B
BA1	READ		TRY AGAIN IF BUSY			7	07623 R 07580 C

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LABEL	OPCODE	OPERAND	TAPE OPERATIONS TEST	CT	ADDR	INSTRUCTION
*		WRITE,READ & U.C. ROUTINES MERGE AND CONTINUE TESTING IN COMMON ROUTINE				
MERGE	BCE	*E8,TAD5,1	HALT AFTER 1 I/O OP	12	07630	B 07649 01005 1
	B	*E2	CONTINUE	7	07642	J 07650
H			I/O AREA AT 09400 FOR DISPLAY	1	07649	*
BYPASS	NOPWM			1	07650	N
B	RESTOR		BYPASS ALL ERROR CKS	7	07651	J 07762
CW	RWDSW0E1		DONT GO TO FAST RWD	6	07658	□ 08314 G
BA1	TSTIND		TEST ALL STATUS IND	7	07664	R 07931 M
BCE	RESTOR,TAD4,1		NO OVERLAP	12	07671	B 07762 01004 1
*		TESTING OVERLAP OPERATION - PHASE 2				
*		PHASE 1 DONE IN TSTDOL ROUTINE				
CKOLAP	BCE	TSTD4M,WHT-10,U	WAS OP A U.C.	12	07683	B 07707 08232 U
TESTX1	BCE	CK40IP,WHT-9,	NO- MUST BE M/L OP	12	07695	B 07744 08233
TSTD4M	BCE	CK40IP,WHT-6,M	WAS IT U XXN M	12	07707	B 07744 08236 M
	BW	RESTOR,OIPSW-1	SHOULDNT & DIDNT BOL	12	07719	V 07762 01193 1
ERROR	99	SW	SHOULDNT BOL & DID	6	07731	* 00300
	B	RESTOR	OK, CONTINUE	7	07737	J 07762
CK40IP	BW	RESTOR,OIPSW	SHOULD BOL AND DID	12	07744	V 07762 01194 1
ERROR	98	SW	SHOULD BOL AND DIDNT	6	07756	* 00299
*		END OF OVERLAP TESTING				
RESTOR	CW	BYPASS1	RESTORE BYPASS SW	6	07762	□ 07651
S	DCCNT		ZERO D C ERROR COUNTER	6	07768	S 01148
S			ZERO WLR ERROR COUNTER	1	07774	S
MLCA	STDWRIT,WHITEG9		RESET STD WRITE OP	12	07775	D 07818 07372 1
MLCA	STDRT,READE9		RESET STD READ OP	12	07787	D 07824 07589 1
BNQ	CTRL		TO CONTROL ROUTINE	7	07799	J 01010 Q
B	OERETURN		RETURN TO MAIN LINE	7	07806	J 000M0
*		*****				
STDWRIT	DCW	209400W3	B ADDR & D MOD FOR STD WRITE	6	07818	
STDRT	DCW	209400R3	B ADDR & D MOD FOR STD READ	6	07824	

TAPE OPERATIONS TEST

LABEL	OPCODE	OPERAND	CT	ADDR	INSTRUCTION	TO20	PAGE
CLEAR	SBR	CLRXIT5		7	07825	G 07860 B	59
	CS	BUFRNDE1		6	07832	/ 09986	
	CS			1	07838	/	
	CS			1	07839	/	
	CS			1	07840	/	
	CS			1	07841	/	
	CS			1	07842	/	
	CS	GMWM,BUFERRECLEN		12	07843	D 01009 09U#0 ?	
CLRXIT	B	00000		7	07855	J 00000	
*							
*							
*							
*							
TST4OL	SBR	OLIXIT5		7	07862	G 07929 B	
	BCE	OLIXIT,TAD4,1		12	07869	B 07924 01004 1	
	CW	OIPSW		6	07881	a 01194	
	SW			1	07887		
	BOL1	OIP		7	07888	J 07902 1	
	B	OLIXIT		7	07895	J 07924	
OIP	SW	OIPSW		6	07902	a 01194	
	CW	•--6		1	07908	u	
	BOL1			7	07909	J 07909 1	
AREOTO	NOPWM			1	07916	N	
	SER	XAREOT		7	07917	G 00059 E	
OLIXIT	B	00000		7	07924	J 00000	

TEST OVERLAP IN PROCESS - PHASE 1

LABEL	OPCODE	OPERAND	TEST ALL STATUS INDICATORS	C1	ADDRS	INSTRUCTION
TSTIND	MLCA	ALLIND,INDSET	SET ALL IND IN MESGE	12	07931	D 01146 08248 T
	BNR1	*E13	NOT READY	7	07943	R 07962 1
	MLCS	ABLANK,INDSET-5	REMOVE STATUS	12	07950	D 08249 08243 3
	ACAI	*E13	AUSY	7	07962	R 07981 2
	MLCS	ABLANK,INDSET-4	INDICATORS FROM	12	07969	U 08247 08244 3
	BER1	*E13	DATA CHECK	7	07981	R 08000 4
	MLCS	ABLANK,INDSET-3	MESSAGE IF THEY	12	07988	D 08249 08245 3
	BEFI	*E13	CONDITION	7	08000	R 08019 8
	MLCS	ABLANK,INDSET-2	WERE NOT SET *	12	08007	D 08249 08246 3
	BWL1	*E13	WLR	7	08019	R 08038 -
	MLCS	ABLANK,INDSET-1	ONLY INDICATORS	12	08026	D 08249 08247 3
	BNT1	*E13	NO XFER	7	08038	R 08057 B
	MLCS	ABLANK,INDSET	SET ARE LEFT	12	08045	D 08249 08248 3
	BCE	CK4HT,TADB,1	NO STATUS IND TIMEOUT	12	08057	B 08281 0100H 1
	B	ERRCTL	TO ERROR CONTROL RT	7	08069	J 08188
			•CHECK FOR ERROR MESSAGES			
	CK4WMS	SW	ERK9961	6	08076	* 00301
	SAR	SXR3	SET START OF ERR SCN	7	08082	G 00064 A
	CW	LASTWM1	IN INDEX REGISTER	6	08089	□ 08115
	SCNL8	09999,06SXR3	END OF TABLE SWITCH	12	08095	D 09399 00'00 -
	SBR	SXR3	SCAN ERROR TABLE	7	08107	G 00064 B
		NOPWM	BAR IS B FIELD WM-1	1	08114	N
	BCE	NOMOWM,16SXR3,H	LASTWM1	12	08115	B 08268 00'01 H
	BCE	CK4LUP,16SXR3,H	END OF ERROR TABLE	12	08127	B 01869 00'01 H
	SW	LASTWM1	CLEAR SWITCH	6	08139	* 08115
	CW	16SXR3	CLEAR WMS	6	08145	□ 00'01
	MLCB	ABLANK,INDSET	BLANK OUT FIELD	12	08151	D 08249 08248 L
	MLCB		ALL OF IT	1	08163	D
	MLN8	SXR3,INDSET-4	SET ERROR NUMBER	12	08164	D 00064 08244 J
	MLCA	LERROR,WHAT-6	SET ERROR IN ERROR MESSAGE	12	08176	D 01140 08236 I

TAPE OPERATIONS TEST

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CT ADDRS INSTRUCTION

* • ERROR CONTROL ROUTINE

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
ERRCTL	BCE	CK4HLT,TAD0,1	12	08188	B 08281 01000 1
	MLNB	SXR2,WHERE	12	08200	D 00034 08254 J
S		SEVEN,WHERE	11	08212	S 08731 08254
B		TYPEIT	7	08223	J 09344
DCW	a*	a	7	08236	
WHAT	a	a	6	08242	
INDSET	a	a	6	08248	
ABLINK	a	a	1	08249	
WHERE	BW	000000a,G	5	08254	
NOMOWM	CW	SCN4ER,LASTWM1	12	08256	V 08095 08115 1
	BNQ	LASTWM1	6	08268	D 08115
CK4HLT	BCE	CTRL	7	08274	J 01010 Q
	B	HALT,TAD2,1	12	08281	B 08300 01002 1
HALT	H	HALTE1	7	08293	J 08301
	BCE	AWMSET,WHAT-10,E	1	08300	*
RWDWSW	NOPWM	NOT A STATUS IND ERR	12	08301	B 08376 08232 E
	B	NEXTD	1	08313	N
	BCE	EOFRT,INDSET-2,B	7	08314	J 06665
	BCE	NRDYRT,INDSET-5,1	12	08321	B 08449 08246 8
	BCE	DCERT,INDSET-3,4	12	08333	B 08425 08243 1
	BCE	WLROUT,INDSET-1,B	12	08345	B 08463 08245 4
	B	RESTOR	12	08357	B 08493 08247 B
AWMSET	BCE	CTERNO,INDSET-5,0	7	08369	J 07162
	B	CK4LUP	12	08376	B 08395 08243 0
CTERNO	A	ONE,WMERCT	7	08388	J 01869
	BCE	NRDYRT,WMERCT,3	11	08395	A 08681 01147
	B	06SSR2	12	08406	B 08425 01147 3
		REPEAT ROUTINE	7	08418	J 000.0

LABEL	OPCODE	OPERAND	C/I	ADDRS	T020	PAGE
					INSTRUCTION	
• • • • • • •						
•		• ERROR ROUTINES				
•		• NOT READY ROUTINE				
NRDYRT	B	TYPEIT			7 08425 J 09344	
	DCW	a* DROPPEDa,G			9 08440	
B	NEXTDR	GU GET NEXT DRIVE			7 08442 J 01696	
•		• END OF FILE ROUTINE - WHILE WRITING				
EOFRT	B	RWD			7 08449 J 06875	
	B	0&SX2			7 08456 J 000'0	
•		• DATA CHECK ERROR ROUTINE				
DCERRT	A	ONE,DCCNT			11 08463 A 08681 01146	
	BCE	RESTOR,DCCNT,3			12 08474 B 07762 01146 3	
B	WHERE2	BYPASS REC AFTER 3				
		TRY AGAIN			7 08486 J 08516	
•		• WRONG LENGTH RECORD ROUTINE				
WLROUT	A	ONE,WLCNT			11 08493 A 08681 01149	
	BCE	RESTOR,WLCNT,3			12 08504 B 07762 01149 3	
•		• WHERE2				
	BSP	11			• 08516 U XUL H	
	BEX1	*E8,B			7 08521 R 08535 L	
BA1	•-18				7 08528 R 08516 G	
SKP	10				5 08535 U XUO E	
BEX1	*E8,B				7 08540 R 08554 L	
BA1	•-18				7 08547 R 08535 G	
BCE	WRITE,WHAT-1,W	TRY AGAIN IF BUSY			12 08554 B 07363 08241 W	
BCE	READ,WHAT-1,R	IT WAS A WRITE OP			12 08566 B 07580 08241 R	
B	UCONOP	IT WAS A READ OP			7 08578 J 06970	
		MUST HAVE BEEN A UC				
UPREND	H				1 08585 .	

TAPE OPERATIONS TEST

T020 PAGE 63
CT ADDRS INSTRUCTION

LABEL OPCODE OPERAND

TALLEY TABLE FOR BITS DROPPED

DROPD1	DC	a1-a	2	08587
	DCW	a	4	08591
		a2-a	2	08593
DROPD2	a	a	4	08597
		a4-a	2	08599
DROPD4	a	a	4	08603
		a8-a	2	08605
DROPD8	a	a	4	08609
		aA-a	2	08611
DROPDA	a	a	4	08615
		aB-a	2	08617
DROPDB	a	a	4	08621
		aC-a	2	08623
DROPDC	a	a	4	08627

TALLEY TABLE FOR BITS PICKED UP

PICKD1	DCW	a1 a	2	08629
		a2 a	4	08633
PICKD2	a	a	2	08635
		a4 a	4	08639
PICKD4	a	a	2	08641
		a8 a	4	08645
PICKD8	a	a	2	08647
		aA a	4	08651
PICKDA	a	a	2	08653
		aB a	4	08657
PICKDB	a	a	2	08659
		aC a	4	08663
PICKDC	a	a	2	08665
ERRCNT	a	a	4	08669
			1	08670

TAPE OPERATIONS TEST

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
	DC	# #	1	09337	A C BIT
	DCH	#-#	1	09338	A B BIT
	DCW	##	1	09339	AN A BIT
	DCW	##	1	09340	AN B BIT
	DCW	#4#	1	09341	A 4 BIT
	DCW	#2#	1	09342	A 2 BIT
	DCW	#1#	1	09343	
A1BIT					

TYPING ROUTINE

	SBR	TYPE#8	STORE ADDRESS OF MESSAGE	7	09344	G 09359 B
	WCP	00000	TYPE MESSAGE	10	09351	H ZTO 00000 W
	SBR	TYPEEXTS	STORE ADDRESS FOR RETURN	7	09361	G 09387 B
	BCB1	TYPE		7	09368	R 09351 2
	BAJ	*#1	RESET INTERLOCK	7	09375	R 09382 G
	TYPTEXT	B 00000	RETURN TO MAIN PROGRAM	7	09382	J 00000
		H	DEFINE PRECEDING BRANCH LENGTH	1	09389	.
	ORG	9390			09390	
	RECNO	00000#	RECORD NUMBER	4	09393	
LENGTH	DC	00000#	RECORD LENGTH	5	09398	
LABEL	DC	##	LABEL FOR LONG RECS	1	09399	

LABEL	OPCODE	OPERAND	CT	ADDRS	INSTRUCTION
* INITIALIZATION- ONE TIME ONLY THIS AREA IS ALSO THE BUFFER AREA * IT WILL BE CLEARED OUT WHEN SETUP IS DONE					
SETUP	ORG	9400			CLEAR THE WHOLE AREA
	CS	332			
	CS				
	CS				CLEAR OUT INDEX REGS
	SW	95,20			SET WMS IN XRS
MLWB	MLWB	95,90			MOVE WMS THRU XRS
MRCW		RESET1-6,1			MOVE RESET-RESTART
MRCW					AND WMS
MRCW					
MLCWS	GMWM,ERR01-2				SET FOR END OF SCAN
B	TYPEIT				
C	DCW	@T020CA,G			

* CHECK SYSTEMS CARD FOR INFO NEEDED

BCE	NOSYS1,SYS1,	NO SYSTEM CARD	12	09472	B 09704 01256
BBE	HOBIG,SYS1,-	TEST FOR 7010	12	09484	W 09525 01256
CW	WT0SW61,RTGSW61	OVERLAP WT-RT EOM OK	11	09496	□ 07119 07512
SW	GO210KE1	ROUTINE ABOVE 10K IF 7010	6	09507	▪ 04249
MRCWG	TOTENK,ODEVN1	MOVE ROUTINE ABOVE 10K	12	09513	D 09735 10000 L
HOBIG	A SYS1,E0MAN1-4	SET UP END OF MEMORY	11	09525	A 01257 01126
A	ONE,E0MAN1	MAKE CONST EQU E0M61	11	09536	A 08681 01130 G
BBE	*E7,E0MAN1-4,T	BR IF NOT A 10K SYSTEM	12	09547	W 09565 01126 G
S	E0MAN1	SET TO 00000- WRAP-AROUND ADDRESS	6	09559	S 01130
A	SYS1,WEADR-4	SET X-REG EQU E0M-10	11	09565	A 01257 01131
BCE	*E13,SYS1&/.1	OVERLAP AVAILABLE	12	09576	B 09600 01263 1
HLNS	ONE,TAD4	-N/A DONT TEST OLAP	12	09588	D 08681 01004 1
A	ONE,CHANOS	CHAN 1 ALWAYS THERE	11	09600	A 08681 00020
BCE	*E12,SYS1&13,		12	09611	B 09634 01269
A	TWO,CHANOS&1	CHANNEL 2 AVAILABLE	11	09623	A 08691 00021
BCE	*E13,SYS1&14,	CHANNEL 3 N/A	12	09634	B 09658 01270

LABEL	OPCODE	OPERAND	TAPE OPERATIONS TEST	CT	ADDRS	INSTRUCTION
MUNS	THREE,CHANDS&2		CHANNEL 3 AVAILABLE	12	09646	D 08744 00022 1
BCE	*612,SYSIG15,		CHANNEL 4 N/A	12	09658	B 09681 01271
A	FOUR,CHANDS&3		CHANNEL 4 AVAILABLE	11	09670	A 08701 00023
CW	START1		DONT COME HERE AGAIN	6	09681	D 02001
B	START		ALL DONE, RETURN	7	09687	J 02000
RESET1	DCW	@J000:0 a	RESET RESTART ADDR	7	09700	
		a.a			1	09701
		a.a			1	09702
		a.a			1	09703
NOSYSL	B	TYPEIT		7	09704	J 09344
	DCW	ANO SYS CROa,G	NO SYSTEM CARD-SEE SUMMARY PAGE 3	10	09720	
H	SETUP		TRY AGAIN	6	09722	• 09400
H				1	09728	•
DC	a a		FILL IN	6	09734	
ODEVN1	EQU	10000	ROUTINE ABOVE 10K FOR T010			
ODEVN2	EQU	ODEVN1E105				

TAPE OPERATIONS TEST

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LABEL OPCOD OPERAND

CITI ADDRESSES INSTRUCTION

*TEST FOR DATA TRANSFER FROM
ODD STARTING ADDR TO EVEN STOP A
ODD STARTING ADDR TO ODD STOP AD

TOTENK	B	MONITR		7	09735	J	01841
MLNA	3094010,88888	SET XR TO MOD B ADDR		12	09742	D	09999 00054 /
SW	BPRIMWCL	WRITE FROM MOD ADDR		6	09754	*	07345
B	WT	DATA FIELD 1 TO 9		7	09760	J	07027
DCW	DIGITS	COMP ADDR REG TO 09411		5	09771	08750	
C	XAREOT,C09411	ODEVN1E61		11	09772	C	00059 01115
ERROR	85	SW	ERK85	6	09790	*	00286
B	BSP	BPRIMREL		7	09796	J	06894
SW	RT	READ INTO MOD ADDR		6	09803	*	07562
D	C	XAREOT,C09411	COMP ADDR REG TO 09411	7	09809	J	07420
BE	ODEVN1E105	ODEVN1E105		11	09816	C	00059 01115
ERROR	86	SW	ERK86	6	09834	*	00287
B	MONITR			7	09840	J	01841
CS	WKAREA	CLEAR OUT WORK AREA		6	09847	/	00163
MLCA	DIGITS-1,WKAREA-55	SET UP 8 CHAR FIELD		12	09853	0	08749 00108 T
MLCWS	GMWM,WKAREA-54	WITH GM WM IN LOC 9		12	09865	D	01009 00109 7
MLNA	3094010,88888	SET XR TO MOD B ADDR		12	09877	D	09999 00054 /
SW	BPRIMWCL	WRITE FROM MOD ADDR		6	09889	,	07345
B	WT	DATA FIELD 8 CHARS		7	09895	J	07027
DCW	-WKAREA	COMP ADDR REG TO 09410		5	09906	00163	
C	XAREOT,C09410	ODEVN2E91		11	C9907	C	00059 01110
BE	ODEVN2E91	ERK87		7	09918	J	10196 S
ERROR	87	SW	ERK87	6	09925	*	00288
B	BSP	MLNA C00009,RECLEN	SET REC LEN FOR 9 CHARS	7	09931	J	06894
SW	BPRIMREL	READ INTO MOD ADDR		12	09938	D	01090 00049 /
B	RT	COMP ADDR REG TO 09410		6	09950	*	07562
C	XAREOT,C09410	ODEVN2E147		7	09956	J	07420
BE				11	09963	C	00059 01110

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TAPE OPERATIONS TEST

LABEL	OPCODE	OPERAND	C1	ADDRS	INSTRUCTION
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ERROR	68	SW	ERR88	RETURN TO REST OF TEST
	8	NEXTRT	C 3242	6 09981 * 00289 7 09987 J 04256 1 09994

09995
www.
LORG

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        START      R0YTDS-1      CKDRIVE&3
        END       EQU      EQU
        ATONO     EQU      UNITNO

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